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BLISTER RUST NEWS LETTER

FOR

STATE AND PROJECT LEADERS

By the

Western Office -Blister Rust Control

Vol.3,1928.

Spokane, Washington.

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BLISTER RUST NEWS LETTER

for

STATE AND PROJECT LEADERS

* * *

Confidential

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U. S. Department of Agriculture
Western Office of Blister Rust Control
Spokane, Washington

EDITORIAL

The advice of Age to Youth is, "Forget the past, use the present, think in terms of the future." This might well be adapted to blister rust activities with some slight revision--"Learn from the past, use the present, think in terms of the future."

We are building from year to year. Definite progress has been made; mistakes have been made. Yet mistakes should not be passed by with vain regrets. Each mistake has its lesson which helps to point us in the right direction. We must learn properly to evaluate the past in order to approach the future with understanding and courage.

From his experience of past years the leader in each of our several projects formulates his plans for the coming season and for years to come. Are they sound? Are we on the right track? It is only with a comprehensive view of our ultimate aim--our ideal of perfected knowledge and control of white pine blister rust--that we can construct sound plans and rightly judge our progress.

In the near future the personnel of the western office will convene to review past accomplishments and hear the plans of each project leader for the coming season. Here is an opportunity for each to play his part in forming our policies. Intelligent discussion will give each an insight into the other fellow's problem and the relation of his project to the work as a whole. Such association should lead to a better understanding and further cooperation. Yet we can get the most out of this association only by keeping in mind our ultimate object. Upon this depends our degree of success for out of our vision of the future is born our purpose of the present.

CHEMICAL ERADICATORS MAKE MERRY AT BERKELEY

H. R. Offord

There are a number of ways to spend that muchly discussed period between dark and dawn, that is, besides sleeping it away in a wasteful fashion.

In order to while away the dull tedium of the hours between supper and breakfast the chemical crew devised a scheme of experimental work which necessitated the originator of the idea being at the greenhouse for a short time at the end of five hour periods throughout the night. The idea seemed rather clever at its inception, but after two weeks of early matinal communion with undeveloped Ribes, the victim was inclined to question the mellifluous influence of these nocturnal visits.

Some reactionary experiments were substituted following this period but sufficient data were not taken to justify a conclusion as to the relative merits of the two.

BRUSH PILES AND RIBES

S. N. Wyckoff

In an article entitled "Re-inspection of Ecology Plots," western blister rust news letter for December, 1927, there appears the following statement--"The brush had been piled and burned, making a rather idealized logging unit--from the forester's viewpoint. From the blister rust viewpoint, it presents material for considerable thought."

This Lakeview area, under observation by the ecology workers, affords an excellent example of the effect of partial cutting and slash disposal on Ribes occurrence. The area is covered with a stand of young timber, from which cedar poles were removed in 1925. The rest of the stand was not disturbed, and the slash was piled and burned. The results of the ecological study, as recently given to me, show that from 2 to 34 Ribes had germinated near the edge of each burned brush pile, where the duff was only partially consumed, and that about sixty Ribes had germinated on or near the skid trails. My count is not exact on a small scale map, but it appears that between 250 and 275 Ribes appeared on this otherwise Ribes free area of 2/3 of an acre as a direct result of the pole cutting and slash disposal operations. No other Ribes appeared.

My point, Mr. Editor, in addressing to you this long communication, is that I feel that Mr. Rockie thinks that these figures show slash disposal in a bad light. I cannot agree with him. Suppose that clean cutting had been practiced, and the area broadcast burned. How many Ribes would have appeared on this 2/3 of an acre? Several thousand, I imagine, instead of 275 or less.

To my mind, proper slash disposal is going to be one of the biggest lifts that we shall ever get, in our efforts to eliminate Ribes. It will simplify and cheapen Ribes eradication, because it will result in fewer Ribes, and those that do occur can be looked for in definite places--around burned brush piles and along the skidways.

If anyone disagrees with me, I shall be glad to hear from him in the next News Letter.

A NOTE FROM CALIFORNIA

W. V. Benedict

The land of eternal bliss has just registered again. On December 31, 1927 fourteen feet of snow covered last year's eradication area in Sunny California where but a scant inch was found at the same time the year previous. In April, 1926, rangers from that region reported no snow; in April, 1927, six feet covered the area and the entire eradication camp was snowed in on May 29-30. Should the usual heavy spring snows come on top of the already bounteous supply, when will the 1928 field season begin?

EDITOR: Conditions seem to indicate that Multnomah Falls will not run dry this year.

BLISTER RUST LECTURES

Mr. C. R. Stillinger gave a talk on blister rust before the Kloneson Study Club, Spokane, on January 11, 1928. This is a general study club which is studying China this year. Mr. Stillinger reviewed general forestry conditions in China, developed the forestry idea and wound up with a talk on blister rust, illustrated with lantern slides. About twenty-five women were present who were so delighted with the lecture that Stillinger was asked to repeat it before the South Side Garden Club the next day when nineteen women learned about blister rust from him.

RIBES NIGRUM SEED GERMINATION AGAIN

L. N. Goodding

Hello, George. Bless your heart, I hate to revert to the old subject of the germination of black currant seeds, but it seems to me that Bert Fehren sort of put it over on the both of us when he found 500 very fine black currant seedlings in the Russelville Nursery near Portland this summer. The seeds do seem to germinate all right, when the conditions are right. At any rate, the suggestion made to me that the seeds of this plant produced in the west are sterile, seems to be thoroughly disproved. Of course, we are not sure these seeds did not come from England. The nurseryman seemed reluctant to talk about them--merely said they were an experiment. Bert saw that the experiment came to an abrupt stop.

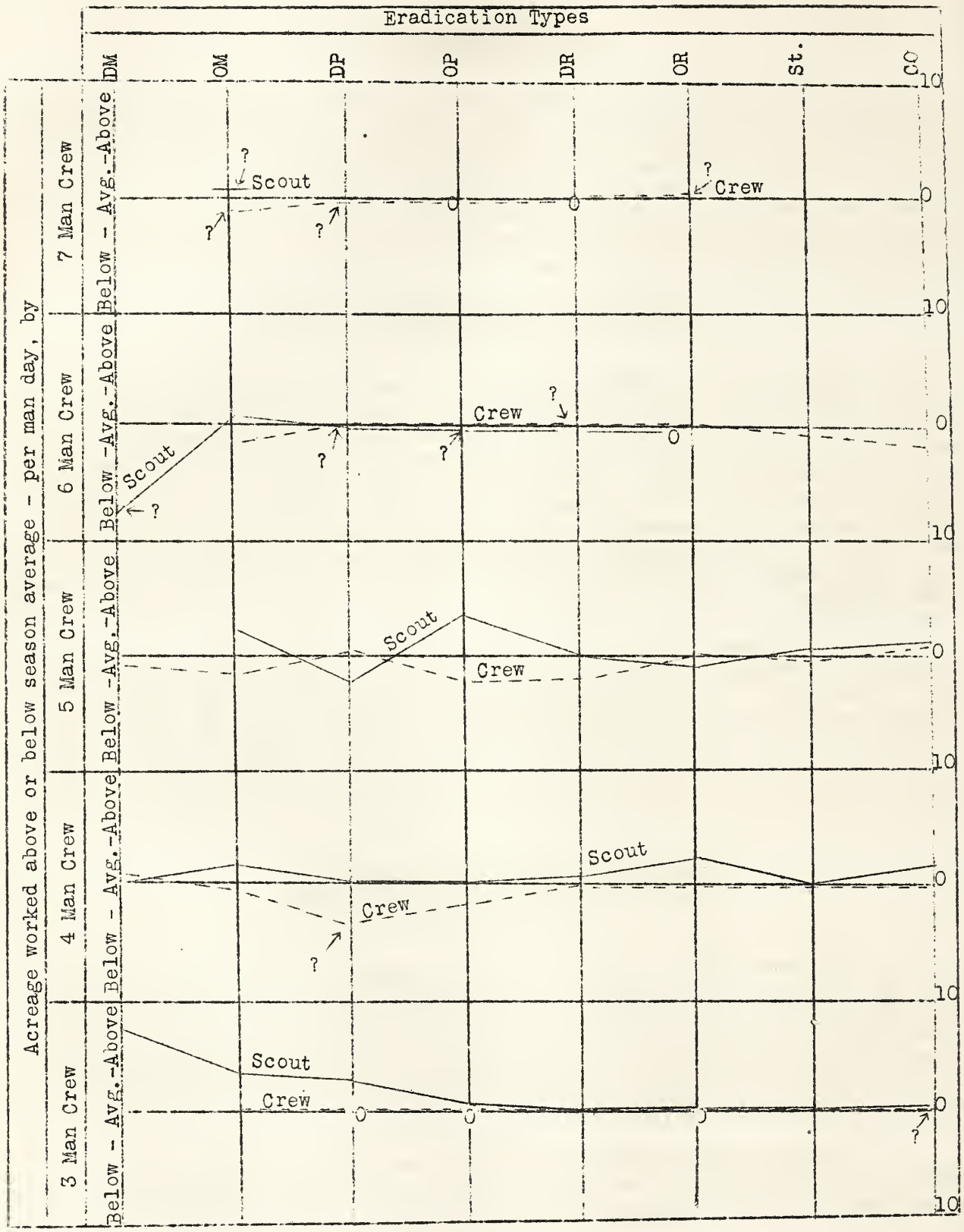
Say, Mister Editor, you certainly choose an opportune time to request attention. Everybody's doing it just now. "Goodding, your annual report must be in January 15." "Mr. Goodding, we will be delighted to hear you at Seminar Thursday morning on the Flora of the Mexican Boundary." "Mr. Goodding, don't you think you can do something toward classifying those plants at this time?" "Goodding, please have your 1928 project reports in the office by January 25," etc., etc. And now you come asking for a brief digest on the summer's work. Say, Mr. Editor, you are just out of luck, that is all.

SCOUTS OR INEXPERIENCED CREW MEN? LARGE CREW OR SMALL ON ERADICATION?

C. C. Strong

The human factor--another of those intangible perplexities with which all industries are constantly struggling--comes in for prominent consideration in eradication activities. Does an experienced scout who is paid higher wages get work done more efficiently and cheaply than does an inexperienced and lesser paid crew man? Should a large or small crew of either scouts or regular crew men be employed? These are questions which furnish perpetual material for thought.

During the 1927 eradication season, an experiment was conducted which throws much light on the subject. Below is a graphic presentation of the results of the experiment:


Acreage worked above or below season average - per man day, by
Eradication Types
DM
OM
DP
OP
DR
OR
St.
CO
7 Man Crew
6 Man Crew
5 Man Crew
4 Man Crew
3 Man Crew
Below - Avg.-Above
Scout
Crew
10
0
10

In scout crews foremen work in line.

The curves, indicating scout or crew, represent the work of experienced scouts and lesser experienced regular crew men. Curves show whether or not the work done by scouts or regular crews, working in various sized crews on all types, was below or above the average work done by a given crew on a given eradication type for the whole season.

Points at which no work was done by a given crew are indicated by breaks in the scout curve or by breaks centered by an "O" in the regular crew curve.

Points represented by only a small amount of work, or weak points, are indicated by a question mark on either curve.

Conclusions:

Little work was done by either type of labor working in seven-man formation since this sized crew has proven too large and cumbersome to handle efficiently. The little data available indicates that work by a seven-man crew is largely below average and that such a large crew should not be used.

The best work done by scouts was by the three and four-man crew where all work was well above average. Five-man scout crews can be employed in the open timber stands and on cutover areas where crew management is simplified.

Crews do best work in formations of four to six men although a three-man crew may be used under favorable conditions.

In general, scouts work far more effectively on timbered areas and, to some extent, on reproduction areas than do regular crews.

On stream type good crew men do about as well as scouts and, because they are lesser paid men, should be used.

Scouts work more effectively on cutover areas than do regular crews.

General conclusion:

Scouts on all but stream type and possibly reproduction types, do more effective and cheaper work.

Scout crews should consist of three and four men. In open timber a five-man crew is effective.

Regular crews should consist of from four to six men generally.

RIBES-FREE STANDS

W. A. Rockie

Eradication, as it must necessarily be done to be most economical, can not adhere closely to an individual eradication type within a given block unit. Almost every block which has been eradicated to date is composed chiefly of one eradication type, but it includes shoestrings and patches of other types.

This procedure quite effectively hides the fact that 95% of a given block is entirely without Ribes and that 5% of the area, consisting of one or more areas of concentrated Ribes, has one hundred Ribes per acre. This makes an average of five Ribes per acre over the entire area. This 5% area having these abundant Ribes is either too small or too patchy to work economically as a separate unit, but the result is that the eradication records do not show the conditions as they truly exist.

The ecology studies, on these same and on similar areas, show less Ribes per acre in the mature, pole and reproduction types, the small scattered concentrations being thrown in the proper classification, namely, stream type, swamp type and burned areas.

If the eradication block lines could practicably be made to coincide with the eradication type lines, and all patches of other eradication types within each area were properly classified, a great majority of the mature and pole eradication types would be entirely without Ribes.

The ecology studies now show most pole and mature stands are without Ribes, while eradication does not. From the experimental viewpoint, a small swamp or stream area within the mature forest is properly called swamp or stream type, while on eradication it has not been separated.

It is believed, from the findings to date, that if each stream and drainageway, no matter how small and seemingly insignificant, were eradicated to its upper limits, and indicated as stream type, the eradication records could then show the mature and pole timber in their true light.

In view of the proposed stream type eradication, it might prove advisable to follow all draws their entire length as a part of that eradication.

BELIEVE IT OR NOT

J. L. Bedwell

It happened near the Canadian line but I'll swear we hadn't had a drink or even smelled one. Riley and I were driving along the road from Sullivan Lake to Metaline Falls when we noticed what appeared to be crickets jumping along on the road. We got out to see what they were and found them to be little toads smaller than a dime. There were literally thousands of them, covering the entire road for a long distance.

EDITOR: Whaddayathink? Toads or Bull Frogs?

Summary of Quarantine Inspection in the Northwest
September 1927 to January 1928.

Inspection Point	Period of Inspection	Shipments Inspected: No. Ribes or Pine Shpts. from Eastern Quar. Zone	Western Quar. Zone	Not Quar. Zone	Number Inspected	Number Not Inspected	Number of Violations: State	Federal	Shipments Reported to States	No. Loose Parcel Post
PARCEL POST										
Pendleton	10/17/27-11/31/27				122					95
Portland	10/10/27-1/1/28		8		1,149			2		1,131
Seattle	10/6/27-1/1/28				6,730			2		
Spokane	9/6/27-12/11/27			2	1,188			2		903
Tacoma	10/10/27-12/22/27		17		990			1	39	910
Total			25	2	10,348			7	39	2,065
EXPRESS										
Pendleton	10/17/27-11/30/27				319	2			125	
Portland	10/10/27-1/1/28		7		1,115			1		
Seattle	10/6/27-1/1/28				2,441			1		
Spokane	9/6/27-12/11/27				519			1		
Tacoma	10/10/27-12/22/27		23	1	746	76		1	26	
Total			30	1	5,198	78		4	151	
FREIGHT										
Pendleton	10/17/27-11/30/27				11	29			11	
Portland	10/10/27-1/1/28				334					
Seattle	10/6/27-1/1/28									
Spokane	9/6/27-12/11/27				40	12			18	
Tacoma	10/10/27-12/22/27		1		49	2			8	
Total			1		480	43			37	

Summary of Quarantine Inspection
in the Northwest
September, 1927 to January, 1928.

Quarantine Violations

Shipper	Transporting Agency	Federal Quarantine 63					
		Black Currants		Other Ribes		White Pine	
		No. Violations	No. Plants	No. Violations	No. Plants	No. Violations	No. Plants
Nursery	Parcel Post			3	26		
	Express			1	24		
Individual	Parcel Post			1	1	3	6
	Express			1	1	2	3
Total				6	52	5	9

Violations Federal Quarantine 63= 11

Ribes shipments = 6 shipments 52 plants
Pine shipments = 5 shipments 6 plants

Violations of Federal quarantine by nurserymen = 4
Violations of Federal quarantine by individuals= 7

BLISTER RUST AT NORTHWEST SCIENTIFIC ASSOCIATION

C. R. Stillinger

On the afternoon of December 29th, 1927, the entire program of the forestry section of the Northwest Scientific Association was made up of a discussion of white pine and the threat of white pine blister rust.

A discussion of the life history and composition of the white pine stands of the Kaniksu National Forest was given by Mr. Marshall of the Priest River Forest Experiment Station. This was followed by an illustrated talk by the writer on white pine blister rust. The topic was then summarized by Dr. E. E. Hubert by a discussion on the management of white pine, the effect upon this management of the invasion of white pine blister rust and possible desirable changes.

NOTES

The O. A. C. Barometer of January 5, 1928, carried the following interesting announcement:

"The engagement of Miss Sarah Vance '25 graduate in Commerce, and Frank Patty '25 graduate in Agriculture, was announced at the Acacia fraternity. Mr. Patty is employed at the U. S. Department of Agriculture. Miss Vance who is teaching at the University of Minnesota is a daughter of H. T. Vance, Professor of Advertising and Selling."

Mr. Patty is at present engaged on laboratory investigations of the stomata and lenticels of Ribes leaves and stems.

Mr. and Mrs. B. A. Ganoung are rejoicing over the arrival of a son on January 4th. Heartiest congratulations, Barney!

* * *

Miss Beatrice McCormick left Spokane December 29th, being transferred to the Washington office.

* * *

Miss Ethel Mellon has been appointed Junior Typist, effective January 4th, 1928.

* * *

C. O. Peterson discontinued quarantine inspection at Tacoma on December 23, 1927, and is now in the Spokane office, helping along the work of the ecology project.

* * *

The annual meeting of the Forest Service District 1 Investigation Committee took place in Missoula, Montana on January 12, 13 and 14. This office was represented by invitation. Mr. S. N. Wyckoff reported on the activities of the Office of Blister Rust Control in District 1. This was followed by an active discussion of ways and means of putting blister rust control into practice.

* * *

D. R. Payne is now in the Spokane office, measuring Ribes leaves for the ecology project.

* * *

M. C. Riley left on January 17th for the U. S. Veterans' Hospital, Tacoma, Washington, where he will part company with his appendix. We wish him the best of luck and a speedy recovery.

* * *

Basketball has come into its own in the Spokane office. A team is being built around these former stars, Ganoung, Peterson, Bell, Benedict, Strong, Kenyon, Geil, Rockie and Putnam which will give the Spokane city champions a run for their money--some day.

* * *

A brain is as strong as its weakest think.

* * *

Vol. 3 February 15, 1928 No. 2

BLISTER RUST NEWS LETTER

for

STATE AND PROJECT LEADERS

* * *
Confidential
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U. S. Department of Agriculture
Western Office of Blister Rust Control
Spokane, Washington

WESTERN PERSONNEL IN CONFERENCE

The annual personnel conference of the Western Office took place in Spokane, February 7 to 10. Papers were read on the several projects and sub-projects, and were followed by a serious and valuable discussion, with a slight leavening of persiflage and whimsicality which helped to make the point of satiety more remote.

There is a certain inspiration in such a conference. Each one will return to his work with renewed vigor. The chief value, however, lies rather in the interchange of views than in any action taken. We must realize how mutually dependent we are on one another--what affects one project to any extent reacts upon all the others. The blister rust problem is developing continually as new and sometimes startling discoveries are made. Resultant opinions may be fallacious through deficient reasoning from inadequate information. A conference of associates in a common problem, who are opinionated yet not bigoted, should result in rectifying and clarifying such opinions; should establish a clearer understanding of the components of our work and thereby establish a surer foundation on which to build. Thus our eventual success will not be the fortuitous result of a hit-or-miss policy but the considered development of a definite program.

STRAINING AT A GNAT

H.N.Putnam

The Editor says that it is better to contribute something of a weakly critical nature than to make no contribution at all. (What?) Hence I would like to call attention to Mr. Goodding's use of the English language as seen on page 3 of the Blister Rust News Letter of January 15, 1928, in an article entitled "Ribes Nigrum Seed Germination Again."

I quote from Goodding's article. "Of course, we are not sure these seeds did not come from England. The nurserymen seemed reluctant to talk about them--merely said they were an experiment---."

My contention is that the Ribes nigrum seeds themselves were not an experiment. Presumably Nature has progressed beyond the experimental stage in producing seeds from R. nigrum. And even if she hasn't done so, I doubt if the Oregon State Leader was discussing that subject. My understanding of Mr. Goodding's article is that the experiment in question concerned the viability of R. nigrum seeds rather than the seeds themselves.

However, Mr. Goodding, I have many glass windows in my house.

TO BLISTER RUST

R.L.MacLeod

Oh Hellish foe! To you, through whose
Insidious attack we yet may lose
Our heritage, we cast the gage
Of defiance. Through every age
Man has been obsessed
With such as you, and sore oppressed
Through vital loss. But you will find
A different foe; we're not the kind
To give up, when some slight reverse
Would nullify our action. The curse
Of strong men is upon you. Your hour
Will come; our panoply of power--
Of knowledge, science, spirit, trust--
Will spell your defeat. By God! it must!

A CORRECTION

W.A.Rockie

The writer desired to offer this explanation of what appeared to be an attack on the Eradication work in a short article entitled "Ribes-Free Stands" in the January News Letter.

In order to express the meaning that was intended, the following should be substituted for paragraph #2 of the original article.

Most blocks of mature or pole timber consist largely, but not entirely, of Ribes-free territory. Let us assume an imaginary unit to illustrate the case. This area has an average of 5 Ribes per acre. The manner in which the eradication is necessarily done for the most economical results, may quite efficiently hide the fact that 95% of that area is entirely without Ribes, and that 5% of the area, consisting of from one to many concentrated Ribes areas, has 100 Ribes per acre. This 5% Ribes territory is of too irregular occurrence to work economically as a separate unit, but the fact remains that the eradication records cannot show the Ribes-free acreage which is present within that block. The writer believes that most patches of Ribes lacustre, no matter how small, are really patches of stream or swamp type, even though entirely disconnected from established drainage channels. Even though disconnected, they are still a part of the drainage system. Presuming that they are, then, for strictly experimental studies, they should be so separated and classified.

Many blocks, more or less similar to this assumed area, are necessarily shown in eradication as having a few Ribes per acre over the entire tract.

RIBES-FREE STANDS AGAIN

C.C.Strong

In the January issue of the Western News Letter appeared an article entitled "Ribes-Free Stands." The general theme throughout was that present hand pulling eradication practices result in the recording of data which do not represent conditions as they actually exist. The statement was made that this practice results in findings which are often in contrast to the findings of the ecological studies.

Should the eradication force attempt to set up types which would cover any condition found the result would be further complication of an already complex type segregation. Reference to the eradication type definitions finally agreed upon by the office personnel, reveals the fact that ample provision has been made for the inclusion in each type, of the small and numerous variations which are normally found in any stand of timber. In other words those variable conditions, not extensive enough to demand separate handling by the eradication crews, must be accepted as a normal part of any given type. I fully agree that these variable "spots" do sometimes harbor many Ribes bushes and the effect is to increase, to some extent, the average number of bushes found per acre on the entire type. This fact, however, does not alter the case for it is necessary completely to cover the type by some form of organized crew in order to find such "spots" and pull the bushes.

The statement was made that "almost every block which has been eradicated to date is composed chiefly of one eradication type but also includes shoe strings and patches of other types." The mental picture obtained from this statement is not substantiated by the facts and would be even less so if it were practical for eradication crews to draw a closer line of delineation between types.

It has never seemed desirable in north Idaho to lay out blocks according to eradication types. The general practice has been to lay out from two to four convenient working areas from each camp site. These working areas are blocks. Blocks are therefore small cross-sections of the general type conditions but subject to local variation. In contrast to the statement made under "Ribes-Free Stands" many of the blocks worked had roughly equal amounts of several types with smaller portions of remaining types. One-half of the blocks worked to date had less than 60% one type. Generally each block had four or five eradication types present and some blocks had all types represented.

A study has been made of 59 blocks covering 29,989 acres, worked in the past three years by eradication crews. It was found that only 4 of the 59 blocks had only one type. These four blocks were very small and totalled only 97.6 acres. Of the other 55 blocks it was found that:

19 had no one type representing more than 50% of the area.

8 had one type representing from 51 to 60% of the area.
10 had one type representing from 61 to 75% of the area.
18 blocks were more than 75% of one type.

By totalling the acreages of the most prevalent block type it was found that the general average on all blocks for the 3-year period was 59% one type. The second most prevalent type averaged 21%, the third 10%, etc. These figures are conclusive evidence, then that only rarely is a block made up chiefly of one type and that generally several types are extensively represented in each block.

The statement was made in "Ribes-Free Stands" that "the ecology studies show less Ribes per acre in mature, pole and reproduction stands because small variations in type were thrown into their proper classification by ecology crews." I don't believe that anyone will argue that this would be practical for eradication crews. Furthermore this is in direct opposition to the idea set forth in the type definitions where such small variations are properly accepted as normally occurring in any type. The job of eradication is a tremendously practical job. Why attempt to base such work on theoretical standards which are not practical in application? Types cannot be made absolute. They must always include variations. I contend that, so long as we are using the present types, the present method of dealing with types by eradication crews is correct and shows clearly what is found on the ground. However, it is possible that improvement might be made by simplifying types.

The following statement also occurs in "Ribes-Free Stands" concerning ecology studies; "From the experimental viewpoint, a small swamp or stream area within the mature forest is properly called swamp or stream type, while on eradication, it has not been separated." This statement misrepresents the facts. In all cases stream type along flowing or intermittent streams and in well defined draws is designated as stream type by eradication crews, and generally worked separately. The usual method is to send a crew or part crew the entire length of the stream or draw after which the block is worked by strips along the contour. It is true, however, that small moist outcroppings and swampy spots, not connected with streams or well-defined draws, are typed according to the surrounding area unless it is large enough to handle separately, in which case it would probably be called stream type or whatever other type it more nearly resembled.

During the 1927 season the checking crew made advance studies on 2,048 one-twentieth acre plots or transects in mature, pole and reproduction stands. These transects were one rod wide and two chains long and lay continuously along advance check strips diagonally crossing blocks and the types within the blocks. Data were recorded by transect and the results tabulated below show Ribes distribution throughout the various types:

Table No. 1

Ribes Distribution on Mature, Pole and Reproduction Stands - 1927.

Erad. Type	No. Adv. Transects	Percent of Transects having the following No. Ribes bushes per Acre																		Total % Transects Having Ribes
		0	20	40	60	80	100	120	140	160	180	200	220 - 300	320 - 400	420 - 500	520 - 600	620 - 800	820 - 1000	1020 and up	
D.M.	401	68	10-	6+	3-	3-	3-	1	2-	0.5	2-	0	2+	0	0.3	0	0.3	0	0	32
O.M.	1133	65	8	5	3+	3	2-	2-	2	1+	1	2-	3	2	1	0.4	0.4	0.1	0.4	35
D.P.	152	71	9	8	1+	2	0.7	3+	0.7	0	0.7	0	0	0	0	2	0	0.7	0.7	29
O.P.	67	81	4+	0	3	1+	0	1+	3	1+	0	0	1+	3	0	0	0	0	0	19
D.R.	89	53	11	3+	3+	2	4+	2	1	4+	2	2	7-	0	2	0	1	0	0	47
O.R.	206	53	9+	5	4	2	1	4	3+	1+	2	2	4+	3	0	1+	2+	0	2	47
All Types	2048	65	8+	5+	3	3	2	2	2	1	1+	1	3	1+	1-	0.5	0.6	0.1	0.4	35

Since these strips were run on a pre-determined compass course the results show very accurately the average conditions. The data proves conclusively that Ribes population is much more general than the reader of "Ribes-Free Stands" is led to believe. However, it must be remembered that eradication crews in 1927 worked on an area where Ribes distribution, especially Ribes lacustre, was somewhat more general than in previous years.

The advance checking and methods crews have classified the Ribes found in such a way as to be of assistance to crew men in searching for Ribes bushes. The classification is called "Sites Where Ribes Are Found." These sites are listed below, the relative importance shown by per cent of each type:

Table No. 2

Sites Where Ribes Are Found

Sites	Types					
	D.M.	O.M.	D.F.	O.F.	D.R.	O.R.
Dry draws	--	1.17%	--	--	--	1.08%
Windfalls under or behind	17.39%	20.60	9.38%	9.88%	39.78%	29.84
Decayed stumps or logs	8.69	7.44	4.69	--	4.40	2.16
Decaying branches (branch mulch)	4.35	4.15	12.50	--	0.55	2.16
Raised ground adjacent to mature trees	4.35	3.92	--	7.41	2.20	0.54
*On creek banks	4.83	2.82	--	--	--	0.27
Around upturns	16.91	12.29	--	7.41	7.73	2.96
Openings in timber	22.23	13.00	1.56	38.26	5.59	15.83
Damp slopes	6.76	4.54	50.00	--	6.60	1.34
Alder bottoms	--	3.60	14.06	--	--	0.27
Rock outcrops	--	1.10	--	9.88	0.55	2.96
Dense brush	14.49	25.37	7.81	27.16	32.60	40.59
Total	100.00	100.00	100.00	100.00	100.00	100.00

* This is stream type on small hillside streams and is classed as stream type by hand pullers.

In conclusion there should be no argument regarding eradication of streams and draws to their upper limits provided that they are bordered by stream type. This is done under the present system and certainly will continue to be done unless it is shown that such types are of so much less danger in disseminating the rust that bottom land, stream and swamp type eradication should be done first.

BRUSH PILES AND RIBES - CONTINUED

W. A. Rockie

In an article entitled "Brush Piles and Ribes," in the January 1928 western blister rust news letter, I wish to quote the fourth paragraph, as follows:

"To my mind, proper slash disposal is going to be one of the biggest lifts that we shall ever get, in our efforts to eliminate Ribes. It will simplify and cheapen Ribes eradication, because it will result in fewer Ribes, and those that do occur can be looked for in definite places--around burned brush piles and along the skidways."

I heartily agree with that quoted paragraph. But I do question that the piling and burning of brush as practiced in this instance is the best slash disposal. It is true that the foresters consider it the best method of disposal yet developed, but future years are certain to bring about progressive changes for the better in this, as in all other lines of forestry practice.

It appears quite possible, yes, even probable, to me that piling without burning may soon displace the present method of slash disposal.

My intention in the preceding article was to present this instance, not in a less favorable light than broadcast burning, but as a procedure which might be still further improved. In other words, I am certain that piling without burning would result in still less Ribes. Carrying the thought one step further, one might suggest leaving the slashing undisturbed after skidding out the logs, and have a still lesser number of new Ribes. Another step in this direction might well be logging and skidding only on the snow which would probably bring about an absolute minimum of Ribes.

An increased fire risk must naturally result from such changed methods, but the resultant lesser stand of Ribes, combined with the suggestions of Mr. E. T. Allen in The Timberman, will more than offset the disadvantages. These suggestions consist briefly of banking the money now used for piling and burning brush. The interest on this banked money at 5 per cent amounts to $192 per square mile per year. Fire protection to the amount of $192 per square mile each summer will provide very effective protection against fire. And the amount in the bank is still intact after the years of fire hazard have passed.

A REVIEW OF SOME RECENT IDEAS ON PHYSIOLOGICAL STUDIES IN PLANT ANATOMY AND THEIR IMPORTANCE IN INVESTIGATIVE STUDIES ON RIBES

H. R. Offord

It is rather premature on my part to outline physiological studies in the anatomy of Ribes before we have found out by a gross analysis which of the many factors is the most important. However, I think that it is always interesting to draw up a mental picture and then watch it fade or brighten under the influence of laboratory investigation.

Let me suggest briefly some of the salient points of Priestley's work and give tentative advice as to where his technique should be valuable to us.

In the past, anatomical studies have been made and data interpreted to explain physiological processes. The important factor as to how those structures or group of working cells were actually made has been neglected. The new school of thought headed by Priestley attempts to study by means of physiological chemical technique the casual factors of plant structure. Natural selection may explain the existence of any useful working mechanism, but the very fact that it is useful tends to mask the real cause of its coming into being and any real explanation of the structure must wait until its development has been traced and interpreted in terms of physico-chemical causation. From this standpoint, that of causal anatomy, a structure is not explained because it is adapted to its surroundings when mature, but as the direct outcome of the reaction between earlier developmental stages and its environment.

This is my conception of research methods that we might use as part of our Ribes ecology program. We want to suppress Ribes in forest stands by some natural means. Let us then study the physiological processes, (for these are Nature's tools used to fashion the finished Ribes) which go on under environmental conditions from the germination of the seed to the formation of the complete plant structure. Consider the light factor. What do the details of structure and development tell us about the phototropic response to that structure? Priestley has data to show that "light acts by virtue of increasing the tissue permeability and by hastening the change in the chemical nature of cell walls which diminishes their extensibility." How does this phototropic response change at different periods in the development of the plant? In other words, where can we look for the vulnerable point in the Ribes cycle?

Consider the moisture factor and the importance of relations of meristematic tissue to water and the morphological results of the difference in permeability of root and shoot meristem. "Results recorded in other papers have shown that the apical meristems of roots and shoots are

dependent upon supplies received from the vascular system. Some experiments up on the quantitative growth of roots, have led us to anticipate that should the supply of solute fall below a certain minimal value the rate of growth of the meristematic tissue will be seriously affected. The relative ease with which the apical meristem of the stem is irrigated with substances, as compared with the supply of these substances to the root apex, is shown to suggest a physiological basis for the important morphological differences characteristic of these two growing points. The difference in permeability of these meristems is due to the composition of the walls. In the stem apex, they are of cellulose, in the root apex they are of unkown substances which are probably in part converted into cellulose by boiling with potash." Before we can intelligently use, let us say, silvicultural methods for the suppression of Ribes, data of this kind are necessary.

Let us consider just one of the many soil factors, say the P_H value, in the light of Ribes ecology or of the action of chemicals on Ribes. "Synthetic metabolic processes are usually condensations involving the release of water from the reacting substances. As reversible reactions, such synthetic processes are aided by the removal of water from an actively synthesizing or growing meristem. The fact that cambial meristems lie across gradients of hydrogen-ion concentration suggests that they occur at the point where important constituent proteins are at their iso-electic point. These proteins thus possess normal affinity for water, which may be drawn from the meristem to the osmotically active cells on either side. Examination of the iso-electirc points of tissue proteins, so far as these are known, suggests that the majority of these proteins have iso-electric points lying within range of the hydrogen-ion concentration observed on the two sides of a cambial meristem." Experimental work with chlorates on Ribes has shown me that there is a definite concentration and a definite P_H value which must be realized before we obtain optimum results.

Studies of the nature of suberin and cutin and of causal factors in cork formation are important from chemical, pathological, and ecological angles. It is particularly necessary for use to know something about the protective tissue of Ribes. Recent investigative work on suberin and cutin states - "Suberin is the name given to a substance present in the median lamella of the wall of the periderm cells, between the middle lamella outside, and the cellulose layer within; to this substance the special properties of periderm, impermeability to water and resistance to H_2SO_4 are given. Cutin is a substance present as a continuous external lamella on the outer wall of the epidermis in leaf and stem to which is assigned the same role in reference to the cuticles. In the layers in which suberin and cutin are present in the cell wall no cellulose can be detected." This is a very important point when we consider contact sprays or the manner in which infection can take place. In the latter case, since the mycelium cannot penetrate leaf or stem by means of a cellulose dissolving enzyme, cytase, which was the conception on the basis of a cellulose structure of the periderm and cuticle, it is apparent that action must take place through the stomata or some abrasion on the leaf

or stem. Infection could take place through the outer lamella if the growing tip of the mycelium could actually force its way through by developing sufficient hydrostatic pressure. This latter point has not been settled in the case of Cronartium ribicola. "On chemical grounds suberin may be regarded as an aggregate of variously modified forms (condensation products or anhydrides) of certain organic acids, the suberogenic acids. Differences between suberin and cutin of different plants, or between the suberin and cutin of the same plant may be traced (1) To different organic acids and different proportions of those acids entering into the composition of the aggregate. (2) To the different conditions under which these acids have been transformed into the modified form in which they are present in the mature aggregate." This latter point is very pertinent to the understanding of differences in susceptibility and may be the key to the situation. Recent studies of the action of $NaClO_3$ on Nitella cells indicate that the oxidizing action of the chlorate ion is exerted chiefly on the cell wall and that no physiological accumulation of the ion takes place within the protoplast. The constitution of the cuticle, periderm and cell walls of the mesophyll would seem to be very important in a consideration of difference in susceptibility of different species.

The causal factors of cork formation in Ribes might well be considered in conjunction with the composition of the cuticle and periderm. "Cork formation has been studied from a generalized standpoint arising out of a study of the effect of the sap contained within the vascular strand upon the meristematic activity of the tissue supplied by these strands. Wound cork formation, the scar left at leaf fall, and natural cork formation all show the following causal sequence; first, the blocking of a parenchymatous surface, usually by a deposit of suberin or cutin formed in the presence of air; secondly, the accumulation of sap at the parenchymatous surface thus blocked; and thirdly, the consequent development and activity of the phellogen amidst this parenchyma. Further experimental evidence is also supplied, confirming previous statements to the effect that preliminary suberisation depends upon air. It is further shown that if the parenchymatous surfaces are artificially blocked by experimental methods, a subsequent sap pressure may produce meristematic activity as a result of which tissues like normal periderm may be formed, save that the walls are not suberized." Cork formation has an important bearing on the resistance of Ribes species to fire or sudden temperature changes as well as to the caustic action of chemical sprays.

It is hoped that this rather sketchy review of some of the important work now being done by J. H. Priestley and his coworkers may stimulate some discussion and perhaps serve as a guide to work which I hope can be undertaken in the not too distant future.

AVOIDABLE WASTE

While we may be considered to be in the same class as the Professor who, when asked by a student what he had written on the student's paper, replied, "I told you to write more plainly," we feel impelled to call attention to a matter which has been stressed several times by the department concerned, with scant result. This is the matter of Penmanship.

As a concrete example may we quote from a statement of auto travel which was brought to our attention recently. The word or phrase as written on the report in long hand comes first, followed by the stenographic translation of same. Here are some of them:

Lake Eloika	Lake Clorpa
On above travel	Ondore travel
Side trips	Sieletups
Port Hill	Port Well
Messrs. Yonden and Detwiler	Messrs. Jonden and Deturlee.

The least discerning of us can readily see the waste of time involved to the writer, to the stenographer and to the disbursing agent. Anyone who has seen the original will testify that the interpretation is justifiable. Yet this writer is not alone. There are others.

Fifteen minutes practice a day for three months will make anyone's penmanship legible. We are willing to prove this assertion to anyone who will submit for that length of time to the tender mercies of the Educational Department.

THE ONLY MAP OF ITS KIND

J. L. Bedwell

While attending the recent investigative meeting of District One of the Forest Service, Mr. Wyckoff was informed that a compilation age class map was to be made of the white pine in the Idaho, Montana and eastern Washington region.

There has never been a map of this kind compiled for the entire white pine area although there has been considerable need for the information which such a map will furnish. The urgent necessity for this information as a basis for future management, recommendations, budgets for allotments, and requests for appropriations has forced the issue.

The district office has requested each forest supervisor to submit such a map of his forest and the adjacent region. Mr. Webb, logging engineer for District One, has been assigned the job of getting

the required maps on those areas outside the forests on which the supervisors have no data.

This office has complied with the request that we furnish such data on lands covered by our reconnaissance.

The final compilation into one map of the various maps submitted will be done at this office since this is more central to the sources of information in case additional data be required on certain areas. This compilation will be supervised by Mr. Webb with our Idaho reconnaissance men collaborating.

The Forest Service is quite anxious to have the map compiled as it will be helpful to them in many other ways as well as in the consideration of the blister rust problem.

NOTES

S. N. Wyckoff left Spokane on February 10th for California where he will check over the laboratory work of the chemical eradication project. He will also attend the Forest Service Investigative meeting for District 5.

* * *

L. N. Goodding, after attending the annual personnel meeting, continued his trip to Washington, D. C. leaving Spokane February 14.

* * *

Mr. Kumler, Junior Forester with the Forest Service spent February 7 to 10 copying reconnaissance maps of areas covered by this office during 1927 on the St. Joe National Forest.

* * *

Roy Calhoun has been appointed Junior Administrative Assistant for the Western Office, and will take up his new duties on his return from an extended trip to his home in Kentucky.

* * *

J. L. Bedwell spent February 14 to 16 in Moscow, Idaho where he interviewed prospective summer employees.

* * *

The stork has arrived at the home of H. N. Putnam. It's a girl! Congratulations, Put!

H. E. Swanson concluded his quarantine inspection work in Portland on February 6th and is now in the Spokane office preparing for the summer's field work.

* * *

The Office of Forest Pathology was represented at the annual personnel conference by Messrs. Lachmund, Mielke and Partington who give us much interesting and useful information on their investigative work in British Columbia.

* * *

Miss M. L. McWold has been appointed Temporary Special Disbursing Agent succeeding Mr. Calhoun. Mrs. M. C. Dowdy, at one time employed on blister rust work in the Washington office, has been appointed as assistant to Miss McWold.

* * *

The female of the species is most deadly on the kale.

* * *

Benedict and Patty went to Moscow on January 14 to interview Dr. Hubert concerning ecology work in California.

* * *

The blister rusters turned out in force to a meeting of the Northern Rocky Mountain Section of the Society of American Foresters on February 4. Sustained yield was the topic under discussion.

* * *

M. C. Riley's appendicitis operation was followed by bronchial pneumonia. However, he is recovering rapidly and expects to be back in the office in the near future.

* * *

The friends of B. A. Anderson will regret to hear that he has spent three weeks in the hospital with an infection in the throat following a tonsillotomy operation. Andy lost twenty-five pounds in weight but has been able to resume his graduate studies.

* * *

Mr. D. S. Olson who is in charge of planting at the Savenac Nursery has sent to this office two mounts of the seeds of various coniferous trees. One of these will be of great value to the ecology project and is on view in Bill Rockie's office. The other one is in the Educational room.

Vol. 3 March 15, 1928 No. 3

BLISTER RUST NEWS LETTER

for

STATE AND PROJECT LEADERS

* * *
Confidential
* * *

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U. S. Department of Agriculture
Western Office of Blister Rust Control
Spokane, Washington

THE DURABILITY OF SUGAR PINE

George A. Root.

Someone has said that "there is no tree in the world that surpasses the white pine in beauty, stateliness, individuality and usefulness". This might be said of the California sugar pine. John Muir has referred to it as the "Queen of the Sierras". One has only to gaze upon its clear, straight, symmetrical trunk of chocolate-colored hue to see that it is set apart from its companions; one has only to pierce the Sierra skyline to see its long graceful arms, outspread as if protecting its less fortunate brothers beneath. Justice would not be done this tree should we forget to mention the unique cones which average 13 to 18 inches and not uncommonly 23 inches in length. They first "sell" sugar pine to the casual traveler in the high Sierras.

According to Government Bulletin #426, "Sugar pine is the most valuable commercial timber tree on the Pacific Coast and its relative value among all the conifers of the world is very high. Of the three most valuable widely distributed conifers within the State of California, redwood, yellow pine and sugar pine---though the sugar pine ranks third in volume of stand, it is undoubtedly first in value of product".

If we can rely upon the opinion of some foresters that the size and age in a general way to which a tree grows indicates the durability of the wood or its resistance to decay, the sugar pine meets these conditions. It customarily grows from 150 to 175 feet high and from 4 to 5 feet in diameter. It is the largest of all the pines. Specimens often grow 7 and 8 feet in diameter and at Dorrington, California, there is one 12 feet in diameter with an estimated height of 230 feet. It must be close to 1,000 years old.

The wood of the sugar pine resists enemies that seem to destroy other trees. It is not particularly subject to fungous attacks although insect pests do considerable damage. This natural immunity in the growing condition is continued after the tree is felled. In contact with the ground, authorities claim that "it lasts much longer than most Sierra species. In the air, even when exposed to all kinds of weather, it shows great lasting properties." The tree has a thin sap ring with a preponderance of heartwood, which gives it great durability.

As the eastern white pine is indelibly linked with the early history of New England and other eastern states so is the sugar pine linked with the early history of California. As the New Englander sits beneath a dwelling built in revolutionary times or even before, he marvels at the construction and durability of the wood which makes this possible; he muses over the romantic stories which are connected with the building of this abode. Some of you are familiar with these fine old mansions and must readily recognize the great durability of the white pine used in their construction.

The tourist of today who voluntarily or by necessity finds shelter in one of the many cabins still standing in the Sierras of California, would be interested to know that this shelter is probably closely interwoven with the

romantic record of the gold rush, that it is constructed mostly of sugar pine indespensable to the '49ers. The early gold seekers usually thought of temporary shelter, yet they selected the wood which would give them the longest service and which because of its straight grain made the labor of building light. On all the first cabins sugar pine was used for roof covering and siding, where resistance to rot was important. Before the advent of railroad transportation sugar pine roofed the cabins in a region 500 miles long. Many of these cabins still stand as evidence of the ability of sugar pine to resist weather and decay.

As the tenor of this article so far has a romantic touch, mention will be made of several well known buildings of historic interest which have stood to this day. One such building is the "Mammoth Trees" Hotel at Calaveras Grove, California. This building was originally put up in 1853 and additions have been made as trade demanded. This hotel played an important part as a pleasure resort for the early Californians and as a hostelry for travelers plying between California and Carson City, Nevada. Its sugar pine roof, sides, sashes and doors are as sound today as when they were put up.

Another old building of historic interest to visitors to Yosemite Park is the old Hutchings Hotel, built in 1859 as a hostelry for the early travelers who made the trip into the famous valley on horseback. Sugar pine, cut in the valley itself, was the principal wood used for roofs, siding and woodwork. As the oldest building standing in the park today, it still receives the traveler within its doors.

The court house at Mariposa, California, in the county of the same name, was constructed in 1854. It is virtually all of sugar pine and still houses the county departments.

Built in the days of '49, the adobe trading station of a Major Savage, at one time an Indian Commissioner, stands today on the Fresno River, still roofed with the shakes split from a sugar pine over 75 years ago. These shakes, despite neglect and battering of the elements for many years, still serve as a satisfactory covering for the old trading station. The exposed ends of the shakes are worn away to almost paper thinness through the attrition of wind and rain, but there is no evidence of rot.

Bret Harte and Mark Twain knew the tree well and their stories are of men whose lives were spent under shake roofs split from sugar pine. One of the best known of these cabins is situated at Groveland, California, on one of the main highways leading into Yosemite Park. It is said to have been the home of "Tennessee's Partner" the pathetic and loyal character portrayed in Harte's story of that name.

The average individual is prone to look back with regard and reverence upon the historical background of his or her community, state or nation. The greatest interest naturally centers in the pioneers themselves, followed by the type and construction of their habitations, their vehicles of transportation and their working tools. If we can enhance our project by creating interest in the tree which we are endeavoring to protect, through the romantic as well as the dollars-and-cents side, let us do so.

PRE-ERADICATION WORK AT BREMERTON, WASHINGTON

H. N. Putnam.

During the week of March 19 to 25 it is planned to make a pre-eradication study of the Mountaineers' pine stand and surrounding territory near Bremerton, Washington. It is expected that this area will be protected on a cooperative basis.

This will be the first commercial eradication job carried on in an infected region in the West. It offers an excellent opportunity to study the effectiveness of control.

Messrs. Benedict and Kenyon will stop over on their way to California long enough to help out on the job. Other men lending their services will be Messrs. Strong, MacLeod, Edmunds and Putnam.

IMPORTANT POINTS TO BE CONSIDERED IN HIRING MEN FOR RIBES ERADICATION

C. C. Strong.

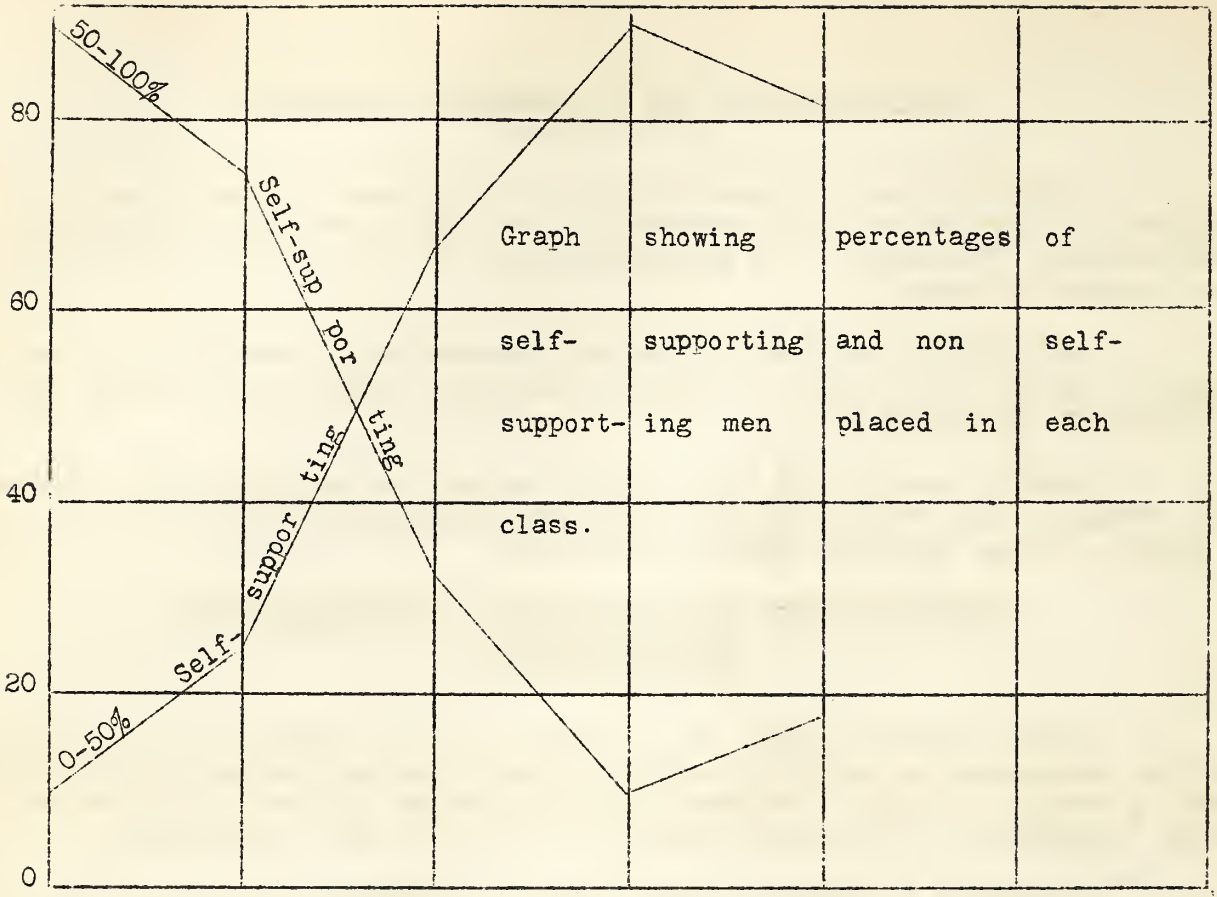
Occasionally one hears of, or meets, a rare specimen of the genus homo who possesses the ability to size up a man's general fitness for a specific piece of work at a glance. Fortunately, or unfortunately, most of us are not mental telepathists and we must resort to honored and time worn customs.

The method of picking suitable men for eradication crews has long been a source of controversy. No two men consider with equal weight the various qualifications. Yet it must be admitted that both are always right to a certain extent.

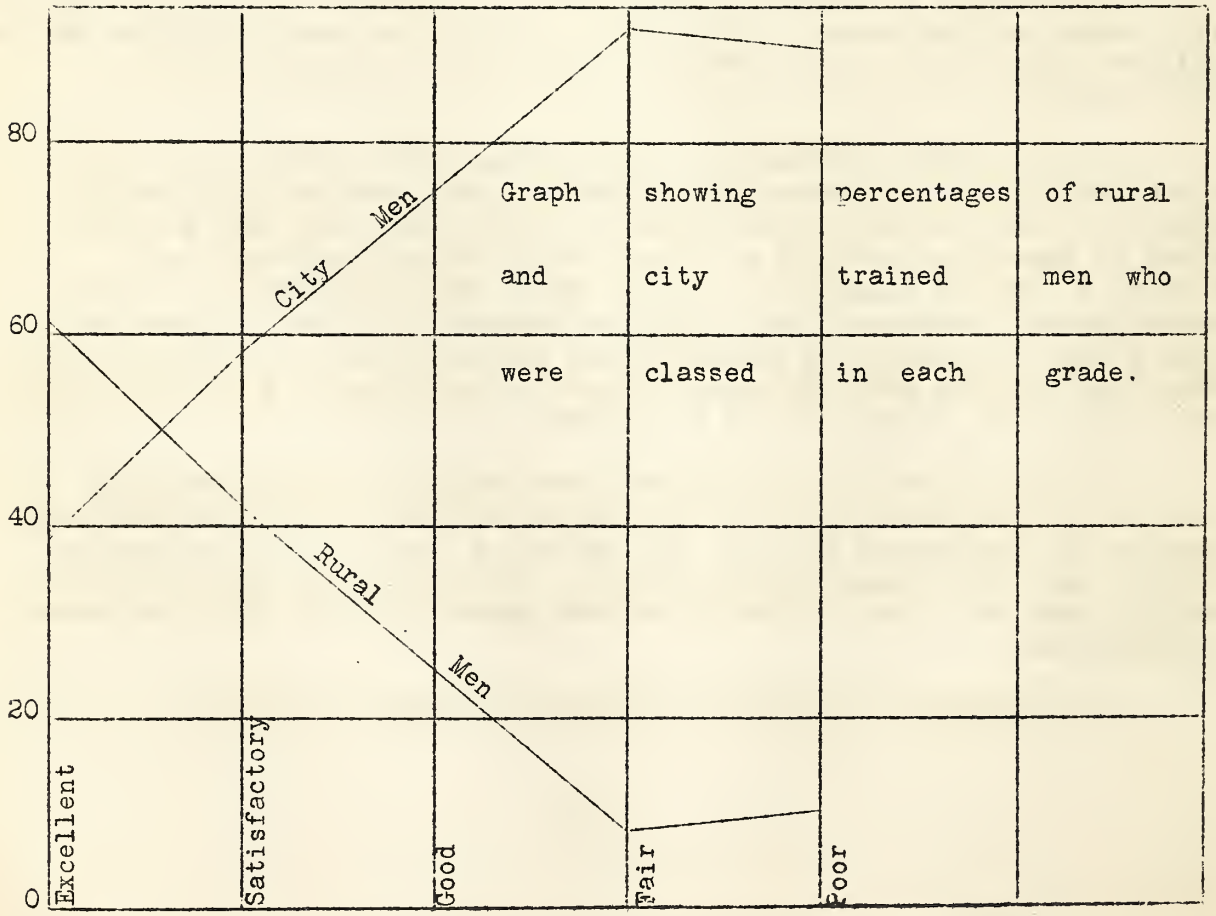
It is seldom satisfactory to hire a man on the basis of an application blank which he has personally executed. Many good men would not be judged so by the information they submit. On the other hand many poor men present an impressing array of so called qualifications and experiences. Therefore it becomes necessary to use the basic facts presented as to age, physical makeup, education, etc., only and relegate all other information to second place. As to a man's qualifications and experience it is far better to obtain that from his past employers, if such be convenient. A personal interview finishes the job and one has the information one needs.

In an effort to arrive at some more basic facts which should be considered of importance in hiring men a study was made of 1927 personnel employed by the eradication project. The matter of obtaining the information necessary was left to supervisors of units. Each supervisor was furnished a blank for each of his men. Supervisors also graded each man after the season was completed.

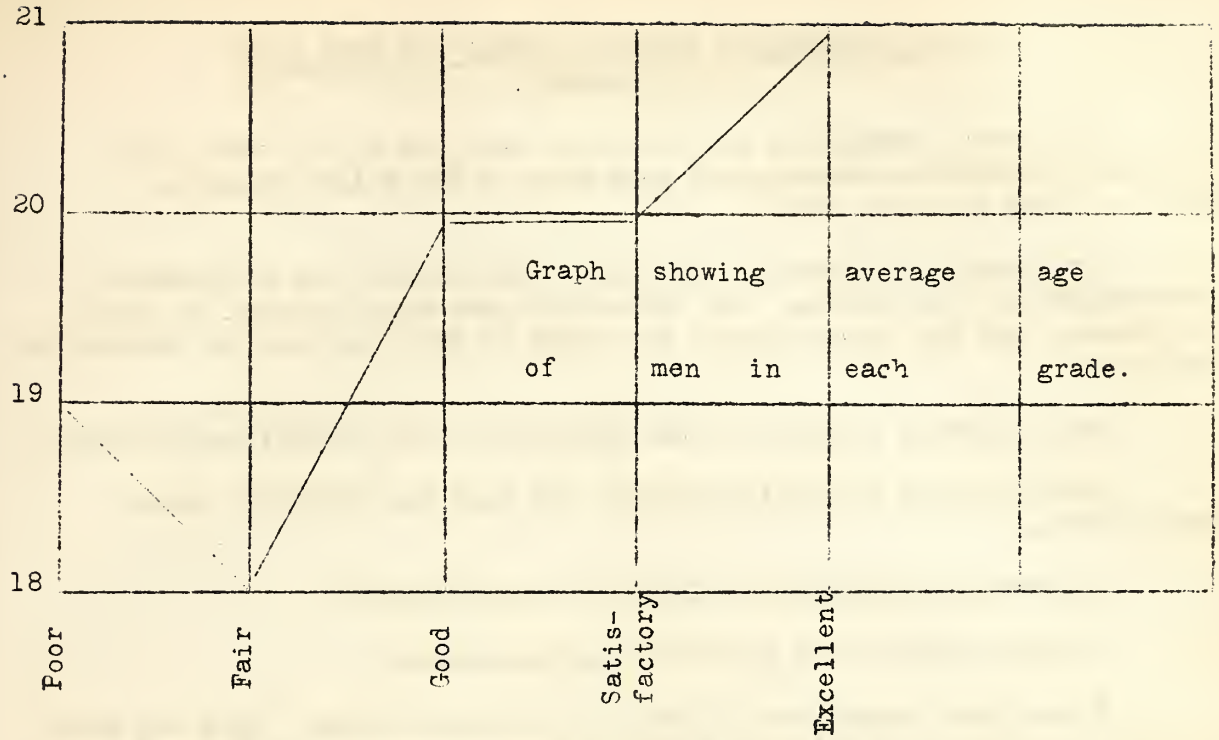
The summary of the data so collected is shown as follows:



Graph showing percentages of self-supporting and non self-supporting men placed in each class.



Graph showing percentages of rural and city men who were classed trained in each grade.



Many other factors were considered but these three only showed definite results. It would seem that this evidence is conclusive and that these three factors should receive greatest consideration when hiring men for the hand pulling of Ribes.

MEETING OF SOCIETY OF AMERICAN FORESTERS NORTHERN ROCKY MOUNTAIN SECTION MOSCOW, IDAHO, MARCH 10, 1928.

The afternoon meeting of the Society was entirely devoted to papers and discussions on the blister rust problem. Dr. E. E. Hubert opened the program with a paper on "Management of White Pine Areas in Relation to Blister Rust Control". C. C. Strong, of this office, followed with a paper on "The Application of Blister Rust Control in the Inland Empire". Mr. W. W. White, of the Forest Service, closed the program with a paper answering the question "Is White Pine Necessary to Future Forestry Practice in the Inland Empire ?"

Following the afternoon session some 50 lantern slides were shown to about 75 people, mostly foresters. This number included many people who had neven seen any of the blister rust slides.

The evening session was devoted to papers and discussions on wood utilization and growth of residual stands of timber after logging.

Bedwell and Strong of the Spokane office attended these meetings. They also conducted business in Moscow, Friday, and the Saturday morning previous to the meeting.

IDAHO COOPERATIVE PROGRAM ASSURED FOR NEXT YEAR

J. L. Bedwell.

The annual membership and directors meetings of the five north Idaho timber protective associations were held at 310 Eilers Building, Spokane on March 12th and 13th.

Considerable discussion was had on the blister rust cooperation as recommended by this office. Our recommendations were approved in every case, however, and the proper action was taken to make the program financially effective.

The following cooperation was approved by the several associations:

Coeur d'Alene Association passed the item for $1500 for reconnaissance work.

Clearwater Association, $1500 for reconnaissance.

Potlatch Association $1500 for reconnaissance.

Priest Lake Association $1500 for eradication work. This was voted to be used in conjunction with the $2600 of State money and the Federal money which was to match the total amount of State and Association funds. One stipulation made by the Association was that their allotment was to be contingent upon the Federal Government meeting this amount dollar for dollar.

The North Idaho Chamber of Commerce recently appointed a blister rust committee composed entirely of laymen not interested in timber or lumber. Mr. G. E. Erb, Chairman of this Committee, attended the joint meeting of the North Idaho Forestry Association and gave a very interesting and comprehensive talk on the blister rust situation and its significance to the State of Idaho. He invited the cooperation of foresters, lumbermen, and the Office of Blister Rust Control in furnishing the committee with information which they need to present to the Idaho legislature.

* * *

The following answers on our employment questionaire are not typical of the average applicant:

Woods Experience - Lived on farm four years. Worked two seasons besides. In every case considerable timber near.

Packing Experience - Packing for mail order, express and freight at John W. Grahams and The Crescent, Spokane, Washington.

Farm Labor - Born on one.

Cruising Experience - One year with the Shipping Board.

THE CHEMICAL AND PHYSIOLOGICAL PROPERTIES OF TANNINS AND THEIR OCCURRENCE AND IMPORTANCE IN RIBES

H. R. Offord.

Occurrence - Tannins are found in varying amounts in nearly all of the higher plants and are generally distributed throughout the tissue. They are not infrequently found in green fruits, and occasionally occur in seeds at the time of germination. Tannin can be extracted from leaves, stems, or roots, although the amount varies a great deal from one period of the year to another. It is especially abundant in pathological galls.

Chemical Properties - Tannins are "Amorphous or crystalline solids of astringent taste, soluble in water and freely so in alcohol. They are insoluble in dry ether, benzene, chloroform, or carbon disulphide, and slightly soluble in dilute sulphuric. Their aqueous solutions give blue black or green colorations with ferric salts and are precipitated by lead and copper acetate, and stannous chloride." Tannins fall into one of three large groups depending upon the nature of the precipitate with ferric salts, the presence or absence of a precipitate with bromine water, and the production of a so called "bloom" on leather.

"Tannins have long been regarded as glucosides, Strecker in 1852 showed that they contained glucose. Strecker's formula for tannin $C_{27}H_{22}O_{11}$ showed three molecules of gallic acid and one of glucose. A more recent formula of Fischer and Freundenberg (1912) suggests that tannin is an acyl derivative of glucose. This formula is in agreement with what is known as to the composition, optical activity, small acidity and behavior of the tannin on hydrolysis. The arrangement of tannins in classes is based on the products that they yield --

(1) Heated alone $\longrightarrow$ pyrogallol and catechol.
(2) Heated with dilute acids $\longrightarrow$ dextrose, gallic acid, ellagic acid, and insoluble amorphous anhydrides called phlobaphenes.
(3) Fused with alkali hydroxide $\longrightarrow$ pyrogallol, protocatechuic acid, acetic acid and phloroglucinol.

Tannins of R. petiolare and G. inermis - A proximate analysis of R. petiolare and G. inermis stems and leaves (Van Atta) showed a considerable difference in the benzene insolubles obtained from the two species. Tannin was quantitatively determined by the writer according to the standard hide powder method of the Leather Chemists Association, and analysis showed that G. inermis leaves contained twice as much tannin as did R. petiolare leaves. Moreover, investigation of the nature of these tannins showed differences in the components of the tannin aggregate. The tannins of both R. petiolare and G. inermis belonged to the general group that gives blue black precipitates with ferric salts (a small amount of Group 2 which gives green precipitate with ferric salts was present in G. inermis tannin). On careful heating, R. petiolare

tannin (1) showed the characteristic flake-like crystals of pyrogallol, while G. inermis tannin (2) changed over into a black amorphous mass characteristic of the phlobaphenes. Acid hydrolysis of tannin yielded only a trace of dextrose, gallic acid and a small amount of phlobaphene. Acid hydrolysis of tannin (2) showed a fair quantity of dextrose, no gallic acid and a large amount of phlobaphene. Fusion with KOH gave pyrogallol in case of tannin (1) and phloroglucinol for tannin (2).

The Physiological Importance of Tannins - "According to the investigations of Kraus, tannin does not form unless CO_2 and light are available and the amount of this substance in shaded leaves was less than that contained in leaves of plants fully exposed to the sun. Tannin results from intense metabolism such as occurs in active leaves."

The natural tannins are powerful reducing agents and exhibit a marked tendency to absorb oxygen, particularly in alkaline solution. Moureu suggests that phenolic substances, especially the tannins play the role of anti oxidants. Apparently the life of the plant is least intense where they occur in largest amounts. "The inhibitory effect of tannins on diastase, an enzyme which hydrolyzes starch to maltose (3), has also been observed. The same action has been noticed in the case of the exidases." It is possible that tannins occur in those cells in which there is a physiological lack of oxygen.

Moore states that tannins may play an important part in the lignification of cell walls. Recent data show that they may play an important part in cork formation. He also suggests that when tannin occurs in the epidermis of leaves, it may play a part in the opening and closing of stomata. It also tends to retard the growth of parasitic fungi. In some cases spores are killed, whilst in others germination is much impeded. A low percentage of tannin may stimulate germination and fruiting of fungi.

Summary of Observations Relative to the Tannins of Ribes

1. Tannins are powerful reducing agents and exhibit a marked tendency to absorb oxygen, especially in alkaline solutions. They have an antioxidant action on plant enzymes which tends to slow down physiological processes in plants.

2. Tannin occurs in larger amounts in G. inermis leaves than in R. petiolare leaves and the nature of the tannin components differs in the two species.

3. Lignin, the formation of which is associated with tannin by some writers, also occurs in larger amounts in G. inermis than in R. petiolare.

4. Tannin occurring in the epidermis of leaves may play a part in the opening and closing of stomata.

5. Growth of parasitic fungi is retarded by presence of tannin.

6. Influence on stomatal opening and inhibitory effect on fungal growth suggest that tannin is a factor in the susceptibility of Ribes to blister rust. The interesting idea comes to mind that tannin might be a measuring stick used to express the susceptibility of Ribes to infection.

7. The toxic action of sodium chlorate may be inhibited by the presence of tannins which have the power of absorbing oxygen. There is the possibility that the oxidation products of tannins thus formed would create toxins within the plant system which would exert a poisonous action on the plant. However, in view of the fact that G. inermis leaves contain a greater amount of tannin than do R. petiolare leaves, and that G. inermis is more resistant to the toxic action of sodium chlorate, it seems more plausible to assign a "protective role" or "buffer action" to the tannins.

WILL AERIAL PHOTOGRAPHY AID IN BLISTER RUST CONTROL WORK?

W. A. Rockie

Aerial photographs, such as Mr. H. R. Flint of the Forest Service has been making, would appear to present some possibilities in the work of this office. It might prove an efficient part of eradication.

In these photographs, all brushy areas of alluvial or lacustrine character, are instantly evident to the eye. Any "seepage" spot or opening in the timber canopy, even if only a few feet in diameter, stands out as strikingly as a piece of light green paper on a very dark green background. All small burned or reproduction areas are easily located and segregated.

With such a guide as these photos, it would appear practicable to evolve a plan of field examination of all doubtful areas shown in the aerial photo. All streams and draws, all openings in the timber, all seepages, all burns and reproduction areas, and all rock outcrops are readily differentiated on the picture, and it is the location of such areas which represents one of the chief problems of the eradication men at this time.

In other words, it appears possible that the aerial photograph might permit the delimitation of many Ribes-free heavily timbered areas, because it gives definite knowledge regarding the exact location of potential Ribes sites without covering the ground.

I believe, using our past experience with Ribes as a basis of delimitation, that the use of aerial photographs could readily be developed into an efficient plan of pre-eradication at low cost. The photographs used in the field as the pre-eradication map would appear preferable to present methods.

These ideas are based on a very limited study of aerial photos of northern Idaho, and the suggestion might prove impracticable upon investigation. It is presented for what it is worth.

QUARANTINE VIOLATIONS

C. R. Stillinger

During the first two weeks of March eleven violations of the Federal blister rust quarantine and three of the Oregon blister rust quarantine have been intercepted. Twelve of these were intercepted at Portland during the past week. As a result of a recent survey of the situation in Oregon the following observations were made: The constant interchange of currants and gooseberries between nurserymen in Oregon as well as the general method used by nurserymen of contracting with private parties to grow these plants makes it next to impossible to determine the original source of this stock. This situation also makes it probable that some of this stock may not have been inspected in the field. The situation is further complicated by the considerable movement of this stock by truck. The issuance of blanket certification and no inspection of the material when shipped has been a loophole for violations.

* * *

The following sentences or phrases were culled from various writings of different members of the office. Are they correct? Can they be improved? and "if so, why not?"

I will need.
I would like to have.
A total of 9 man days were spent.
Try and comprehend what this means.
I doubt if he was discussing that subject.
Considerable R. sanguineum was found.
$5000 were spent.
Was tied onto the bush.
Go farther in our reasoning.
As early as is possible to reach the area.
In order to intelligently fight it.
Obtain a true picture as possible.
This was done so a better working knowledge would be available.
In as far as time will permit.

NOTES

One of the western office personnel was not in the office one day last week. The reason for his absence as written on the directory was as follows: "home-sick."

* * *

Percy Bell spent February 17 at the University of Montana, where he interviewed embryonic chemical experts concerning summer employment.

Mr. Paul A. Wohlen, Forest Supervisor of the Clearwater National Forest, spent some time in the office working with Messrs. Bedwell and Riley on the preparation of a cooperative agreement to cover the reconnaissance work on the Clearwater Forest during the coming summer.

* * *

Joy and Swanson left on March 1 for Portland, Oregon; Joy to carry on inspection work there, Swanson to make a study of quarantine conditions in that general vicinity.

* * *

At the invitation of State Forester Ben E. Bush, S. N. Wyckoff attended a meeting of the White Pine Blister Rust Committee of the North Idaho Chamber of Commerce at Lewiston, Idaho, on February 25, to explain technical details of blister rust control.

* * *

C. R. Stillinger left on March 7 for Portland and other points in Oregon to check up on nursery shipments and general quarantine conditions.

* * *

Postscript to a letter received recently from a member of the Washington office, "Mr. Goodding is here, looking breezy and western."

* * *

Harry Geil drove to Moscow on March 10 to attend the meeting of the Northern Rocky Mountain Section of the Society of American Foresters.

* * *

One of the three representatives of this office attending the meeting of foresters in Moscow on March 10, walked into the bath room of his hotel room. The door closed behind him. Strangely enough, at the same instant the catch broke. He was imprisoned. Fortunately, Strong and Anderson came in a few minutes later but it took them nearly an hour to get the door off. We are not mentioning names, but Geil was not among those present.

* * *

Doc Kenyon left on March 15 to push his Ford over the well-nigh impassable roads to Portland. Benedict, accompanied by Strong, followed on the 16th bound for Bremerton. We hope that they arrive. When the Bremerton job is completed, Benedict and Kenyon will continue their drive to California to prepare for the field season.

Vol. 3 April 15, 1928 No.4

BLISTER RUST NEWS LETTER

for

STATE AND PROJECT LEADERS

* * *
Confidential
* * *

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U. S. Department of Agriculture
Western Office of Blister Rust Control
Spokane, Washington

"ALS IK KAN"

S. N. Wyckoff

Several years ago, a now well-known furniture product was first put upon the American market. The trade mark, stamped upon every piece, consisted of a design in which appeared the words "Als ik kan." A literal English translation might read "As I can," or, more freely, "The best that I can do."

The significance of this motto was that every article represented a piece of hand work of which the maker could say, "This represents the best work of which I am capable, and the pride which I take in my workmanship will not permit me to send out of my shop anything but my best work."

Pride in his work is a characteristic which almost no man has developed to too great a degree. At this time of year, when annual reports are being put in final shape, I frequently wish that more of us possessed this quality to a greater degree.

It is incomprehensible that anyone can finally pass on a report which he has prepared, above which his name will appear, and which constitutes his accounting for work done, without being just as certain as possible that it is right in every detail, that every figure checks, that organization, sentence structure, and paragraphing represent his best knowledge of such matters, and that it is prepared with sufficient neatness and legibility to make good copy. The proper degree of pride in his work should make it impossible for anyone to finally approve the rough draft of his own manuscript until he is thoroly satisfied that it is his very best work.

It is not my intention to advocate the general posting of wall mottoes. But if each of us could carry in his mind, or if necessary put up before his eyes, the words, "Als ik kan," and do his level best to live up to them, fewer reports would have to be typed over, and fewer of us would wish, too late, for the opportunity to rewrite our reports in order to make obvious improvements.

WANTED - RIBES PHENOLOGY

W. A. Rockie

From observations during the present and previous years, it appears that Ribes generally comprise one of the earliest groups of woody plants to begin active growth in the Spring.

In early spring, just as the snow is baring some of the ground, interesting observations on the phenology of Ribes have been made.

Each of the four leading north Idaho species, namely Ribes lacustre, R. viscosissimum, Grossularia inermis and R. petiolare have been found with the new leaves out, with from 12" to 24" of packed winter snow still covering the lower parts of the bush. The buds beneath the snow were equally advanced with those not covered. The temperature of the air within this slowly melting (granular) snow registered from 33° F. to 34° F. The soil temperature beneath this snow registered from 34° F. to 36° F.

These and numerous other observations have been made to date, but our records are so few and so scattered that they do not warrant generalizations at this time.

We must know exactly when the various stages of the plant functions do occur, and blank forms have been prepared for the voluntary use of interested members of our personnel.

Our territory is so extensive, the Ribes species so numerous and so wide-spread and climatic conditions are so variable that the help of each member of the office can never secure too many data. The important fact to be remembered is that no long-time "guesses" are desired. The data we need are facts, not long-range forecasts. This means that an individual record taken in April, records only the dates of developments of that particular season and should not include conditions during other periods of the year.

The taking of this data will not greatly interfere with one's other work in the field, and it is only by the combined records of many individuals that we can hope to accumulate sufficient information to be of authoritative value.

EDUCATIONAL WORK BY PRE-ERADICATORS.

Anderson, Strong and Bedwell left Spokane April 18 to make a pre-eradication of the area to be covered by eradication this season on the Priest Lake Timber Protective Association. They returned April 21st.

On Friday evening, April 20, they visited the Priest River Experiment Station and gave a talk to the new rangers who were attending the ranger training school. This school is conducted by Mr. W. W. White, Assisting in Forest Management for District One, and Mr. John B. Taylor, Supervisor of the Deer Lodge Forest. There were seventeen men newly appointed as rangers at this school and they displayed a great interest in the blister rust problem.

These men were invited to submit to the Spokane office any specimens of Ribes or pine which they suspected of being infected by blister rust.

(Nota Bene) "Ye know not the day nor the hour" when you may be called on to hold forth on the subject of blister rust. Be prepared.

SUGGESTIONS REGARDING SCOUTING FOR BLISTER RUST TO BE PERFORMED BY MEN ON PROJECTS OTHER THAN THE SCOUTING PROJECT. REPORT OF COMMITTEE ON SCOUTING.

It is highly desirable for the entire personnel of the office to scout for blister rust at the proper time in connection with their regular work. During the field season, members of the office are scattered thruout the region, often situated in areas difficult to reach. The few men devoting their time to scouting for the rust are unable to cover the entire region, and, owing to lack of time, must necessarily devote their attention to accessible portions. It is strongly recommended that project leaders be held responsible for a certain amount of scouting in connection with their work. If this be done, blister rust scouts can limit their scouting to areas not covered by men on allied projects.

With this end in view, the following suggestions have been drawn up by the Committee on Scouting, February 10, 1928.

1. Time of scouting depends on conditions. Project leaders will be notified as to the best time to start Ribes inspection.

2. In Inland Empire, limit Ribes inspection to R. nigrum, R. petiolare and Grossularia inermis.

3. In Oregon, limit Ribes inspection to R. nigrum, R. bracteosum, R. petiolare, G. inermis and G. divaricata.

4. In general, limit inspection of above mentioned Ribes species to those growing in moist locations and exposed to air currents.

5. Hand pullers should form the habit of inspecting Ribes species growing in favorable situations when bushes are pulled.

6. Men on projects such as reconnaissance, chemical eradication, and ecology, should inspect Ribes species in favorable situations distributed over the areas. Inspection can be done by turning over the branches and examining the under surface of the leaves.

7. Leaf spots other than blister rust occur on Ribes leaves. Comparison with mounts furnished each project leader will show differences between these and blister rust.

8. Send in to office all suspicious-looking specimens. Make complete record as to date found, location, amount of infection on Ribes, distance to pines.

9. At end of season, each project leader should turn in an estimate of number of Ribes by species examined by men on his project.

10. The location of any bushes of R. nigrum should be immediately reported to the Spokane office.

Committee: H. G. Lachmund; L. N. Goodding; H. N. Putnam.

REPUTATION

L. N. Goodding

Last night I had a dream. Oh, yes, I believe in dreams. I found myself distractedly looking through the papers in my brief case for my reputation. Now, curiously enough, I came to the conclusion that I never had that reputation for which I was looking. And this brings me to the point of this writing.

Many of us are guarding jealously something we do not possess. We believe a certain thing and fail to speak our conviction because we fear for our reputation. We remain silent when others express themselves contrary to what we feel to be the truth. We are alone and we wish to preserve our reputation. If we get busy, we shall find that we are preserving something that does not exist. Reputations must be made before they can be preserved.

Some things on my eastern trip impressed me with this idea. New York State last year planted twenty-two million trees. But a short time ago the man who advocated expenditures for protection of a lot of "worthless" reproduction on overtaxed land was risking his reputation. The man who claimed it was possible to get returns on an expenditure of $10.00 or more per acre for planting trees on worthless abandoned land was too simple and harmless to be placed in an asylum.

It was the same story with blister rust control. Anyone could see that the land could not stand the expenditure necessary to clean it up. Now they are actually doing these things and many others. They plant, they protect, they thin, they even prune, and what is more, they are amply repaid for their effort where others could see it couldn't be done. How many believed these things could be done but failed to advocate such measures because of a fear for their reputations?

I laughed at the material I saw going to the mills in the East--small, crooked, knotty stuff, but when I saw them taking cuts three and four inches long, not feet but inches, and converting them into small bucket stays and small boxes; when I saw them taking all sorts of pieces, glueing them together and making perfect piano backs, and converting somewhat longer clear pieces into most beautiful sounding boards; when I saw the blamedest small and crooked stuff converted into perfect chairs worthy of the best dining rooms, my laugh turned to a feeling of awe. No, it can't be done, but they are doing it and reputations and money are being made in fields the fearful did not dare to enter.

Is it not possible that in the West, men will make reputations by losing them? Is it not likely that the consistent profits in the lumber business are going to be made because of the close utilization of everything that falls before the axe? To be sure a lot of these things can't be done,

but they will be done before some of us crawl out of our shells. Long before our virgin forests are gone, even many small timber holders are going to be practicing good forestry and are going to be making use of practically everything taken from their lands, and the things they will do that can't be done are the things that are going to pay dividends.

In planting, which is assuming large proportions in the West, we are going to do many very "ridiculous" things which are going to swell the nation's coffers as well as those of individuals in the future. In this, planting of white pine even outside of Idaho is likely to assume a large place. We are going to find outselves protecting our forests against all sorts of diseases and insects. We shall be utilizing all sorts of tree species we consider weeds today, and we shall go into many "inaccessible" places to get them.

In many of these things some of us will need to lose our reputations.

PRELIMINARY SURVEY OF SAVENAC NURSERY AREA

C. C. Strong

Johnson, Bell and the writer have just completed a preliminary examination of the area surrounding the Savenac Nursery at Haugan, Montana. The purpose was to determine the proper balance between hand and chemical eradication crews needed for the protection of the Nursery. Eradication will be carried on there in 1928.

It is imperative that this area be thoroughly cleared of Ribes and kept so. About three million trees for planting in District 1 are produced annually. Most of these are white pine which are shipped to all parts of the District. Hence the importance of preventing any infection of nursery stock by the rust.

It was found that the area represents an excellent location for testing out relative effectiveness by the two methods of eradication and of securing comparable cost data.

The job will be largely one of stream type eradication. It is characterized by extensive beaver dams covering much of the several miles of stream or swamp type. Bathing suits will be appropriate wearing apparel for the "gooseberry pickers".

* * *

Bell and Whiting took a trip to Clarkia, Santa and St. Maries to gather Ribes for Offord. A logger who happened along was much interested in the proceeding of grinding and pickling the Ribes in alcohol. After trying vainly to figure it out, his only comment was, "Making up a batch, eh?"

STEM PENETRATION OF SODIUM CHLORATE

R. P. d'Urbal

At the suggestion of H. R. Offord, cut stems of the native wild species, R. glutinosum, G. divaricata and in some cases of G. leptosma and R. aureum were placed in solutions of sodium chlorate - 10%, 5% and 1%. Under these circumstances the stems showed no selectivity. The $NaClO_3$ penetrated very rapidly and was found distributed in a very uniform manner in the leaves. The action was most rapid upon G. divaricata, and least rapid upon R. aureum. The leaves became dry in a few days and scintillated upon ignition. Sodium chlorate 5% appeared to act more quickly than did a 10% or 1% solution.

Due to the oxidizing action of chlorates in general, it was thought that perhaps the chlorate applied upon the stems of currants and gooseberries might oxidize the cuticle, pass along the medullary rays, and then enter the xylen and be carried thruout the plant. It also seemed possible that some chemical might penetrate through the lenticels. To study this, a glass jacket made from a test tube was placed around the lower portion of the cut-off stem. Any axillary shoots had been previously cut off flush with the bark and the opening sealed with melted paraffin, collodion or melted grafting wax. The jacket was made water-tight at the lower extremity by calking with cement and grafting wax. Two stems so jacketed were then sealed into a stopper of a wide-mouth bottle filled with water. The Ribes stem is then able to take up water uncontaminated by chemical. Good seals are very hard to get and the Priestley formula (ingredients, wax and sweat 10% - prayer 90%) remains the most satisfactory.

In the first run, stems of R. glutinosum, G. divaricata and G. leptosma were used with 10% $NaClO_3$ in the jackets. The following day G. divaricata and G. leptosma both showed some ClO_3 in the leaves, whereas R. glutinosum was unaffected. The second day found ClO_3 present in all. The leaves became brown and the $NaClO_3$ seemed quite evenly distributed.

The second run consisted of stems jacketed with aqueous solution of Acid Fuchsin and Eosin Y. In less than two hours the leaves of G. divaricata showed markings of Eosin Y along the veins. The stem was cut the following day. When the bark was removed it was found that the dye had penetrated through imperfectly sealed cuts along the stem, or through an insect perforation. The Acid Fuchsin penetrated into only one of the stems of R. glutinosum and there again, it was confined to one spot. A duplicate of R. glutinosum showed no penetration.

The third run was a combination of dye and 10% $NaClO_3$. After sixteen hours one of the two stems of R. glutinosum showed considerable dye, especially along the ribs of the leaves. The other showed no dye nor ClO_3. The stems were peeled. The stem which showed the dye in the leaves was streaked on one side. The dye apparently penetrated through the poorly-sealed cut off shoots, as the dye had concentrated there. The

other stem showed slight local penetration of dye at small, supposedly sealed cuts.

Since great trouble had been experienced in obtaining a good seal of cut-off stem buds and leaves, a special effort was made to obtain material free from buds and leaves in the lower portion of the stem. This was only approximated and as before, buds were removed and the spots sealed by applying melted grafting wax. Stems of G. divaricata and G. leptosma showed no penetration of dye nor of ClO_3 into the leaves for the length of the experiment. (3 days).

From these observations it appears probable that $NaClO_3$ 10% penetrates into the stem either through injuries or through buds, and young shoots and leaves, but probably not appreciably through the bark proper.

Freshly cut stems of R. aureum were inverted in solution of $NaClO_3$ (1, 5, 10%) in order to see if the sodium chlorate would be taken up by the stem when in the reverse position. Penetration and an even distribution of the chlorate was observed although the phenomenon was much slower than in stems standing in the usual upright position.

STOCK IN THIS COMPANY WOULD BE A ---- BUY

March 31, 1928

Service Department, Spokesman-Review
Spokane, Washington

Name of company at Blisterust, Idaho, which employs boys to pull weeds in timber. Agent in Spokane. To whom shall I apply for work? Thanks.

B. H. T. Subscriber.

FRUITING OF RIBES.

W. A. Rockie

In the Gold Hill section near Harvard, Idaho, a group of Ribes viscosissimum which germinated in 1923 was studied on July 16, 1927. The entire group of Ribes has 60% of complete sunlight, is on an easterly slope on the shoulder of a dugway road built into this side hill.

Twenty-five bushes fronting immediately on the road (on the road level) were examined. Of these, 15 were fruiting and 10 were not. Twenty-five bushes on the bank below the road level were examined. Of these 6 were fruiting and 19 were not.

The chief difference between the two groups is that the second group is partially shaded by the first. The first group has 60% of the bushes fruiting. The second group has 24% of the bushes fruiting. The first group has a warmer site, somewhat more light and less of moisture. Which factor causes the difference?

DISTINGUISHING CHARACTERISTICS OF FIVE-NEEDLE PINES

H. N. Putnam

The following two lists showing the characteristics of leaf and current season's growth of five-needle pines were obtained in the summer of 1927 from Doctor Boyce, of the Office of Forest Pathology. *Pinus monticola* and *P. strobus* were readily distinguished on the character of current season's growth in several instances in my own experience.

Leaf Characters of White Pine

Pinus strobus: stomata on ventral surface only. Leaf margin minutely serrate.

Pinus monticola: stomata on dorsal and ventral surfaces. Leaf margin minutely serrate.

Pinus lambertiana: stomata on dorsal and ventral surfaces. Leaf margin minutely serrate.

Pinus flexilis: stomata on dorsal and ventral surfaces. Leaf margin minutely serrate.

Pinus albicaulis: stomata on dorsal and ventral surfaces. Leaf margins entire.

Identification of 5-needle Pines by Means of Current Season's Shoots.

Pinus cembra: clothed with dense orange colored felty hairs, so dense as to almost form a felt-like covering.

Pinus monticola: scattered, minute, reddish hairs.

Pinus lambertiana: minutely hairy all over.

Pinus flexilis: covered with minute brownish hairs or without down.

Pinus albicaulis: scattered, minute reddish-brown hairs, or without down.

Pinus strobus: tufts of short hairs below the insertion of the leaf bundles.

usually without down elsewhere (the pubsecence is occasionally spread over the whole surface of the branchlet, thus approaching the character of P. monticola, but it is denser below the insertion of the leaves).

Pinus excelsa: glabrous and glaucous, darkening in color with age.

NOTES

S. N. Wyckoff went to Olympia on April 10 to confer with the state authorities on the subject of a control area in the State of Washington and on the cooperative phases of the Bremerton eradication area. He also inspected the Bremerton area in company with State Forester Joy and Henry N. Putnam of this office.

After inspecting the Bremerton area, as noted above, "Put" proceeded to Portland to confer with H. G. Lachmund of the Office of Forest Pathology and L. N. Goodding. Here was hatched the plot, reported in this issue, to have scouting done by reconnaissance men, eradicators, ecologists or what have you?

L. N. Goodding, who returned to Corvallis recently from his trip to Washington, spent April 16 in the Spokane office.

Herman Swanson returned to Spokane on April 14 from his quarantine work in Oregon.

Jim Mielke of the Office of Forest Pathology spent April 12 in the Spokane office on his way to Kelowna, B. C. where he will commence his field work.

Frank Patty spent April 25-30 on the infection areas at Nelson and Revelstoke, B. C. gathering phenological data. He reports two and one-half feet of snow on the Revelstoke area with the aecia still hibernating.

Rockie and Bell drove to Lake Eloika on April 4. As the season was not far advanced they did some work on Ribes phenology.

C. R. Stillinger spent March 22 to 25 at Seattle, Tacoma, Puyallup and way points, investigating quarantine conditions.

G. A. Felch left on April 17th for the Veterans' Hospital, Tacoma. Since his return from the American Legion Convention in Paris, he has decided to have an operation on his American twang.

J. F. M.

Vol. 3 May 15, 1928 No. 5

BLISTER RUST NEWS LETTER

for

STATE AND PROJECT LEADERS

* * *

Confidential

* * *

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U. S. Department of Agriculture
Western Office of Blister Rust Control
Spokane, Washington

PINE INFECTION LOCATED AT NEWMAN LAKE, WASHINGTON.

Some time ago our enemy made a sortie from his consolidated position, carried out one or more forced marches to the very edge of the battle ground proper, lay quiescent for a period of entrenchment and development, then blossomed forth to the attack.

Which being interpreted, means that blister rust has been located on pines at Newman Lake, about 20 miles, by airline, northeast of Spokane on the western fringe of our commercial stands of white pine. As it has reached the fruiting stage, this infection center constitutes a serious threat to our white pine belt. The disease was picked up by the Educational Department on May 11, 1928, during the course of gathering material for the Sportsmen's and Tourists' Fair.

Upon the discovery of this infection, the entire personnel of the Western Office was sent out to scout intensively the adjacent territory. As yet, only the one infection area has been found.

In this area, 8 infected pines were located within 1/8 mile of one another, in an open, swamp type growth, closely associated with abundant G. inermis and R. lacustre. On these 8 pines, 21 cankers were found, 10 of them being on one tree. These cankers are classified as follows:

Year Growth Infected	Fruiting Once	Fruiting Twice	Canker Dead
1923	1	1	
1922	1	14	
1921		1	
Unknown			3

This infection resulted apparently from an aecial hit in 1923. The source of the aecia is so far a matter of conjecture. Scouting is being continued by the office personnel until the commencement of the regular field work after which the activities of the scouting project will be centered in the Inland Empire region. It is hoped that the results of the summer's scouting will help to clarify the uncertainties as to the manner of spread of the disease to the Newman Lake area. In the meantime, let us theorize.

LUMBERMEN INTERESTED IN CHEEKYE AND DAISY LAKE INFECTION AREAS.

On May 21, Wyckoff and Putnam will show the Daisy Lake and Cheekye, B. C., infection areas to a number of lumbermen and foresters who are particularly interested in the subject. The party will consist of Messrs. J. P. Weyerhaeuser and C. S. Chapman of the Weyerhaeuser Timber Company, Tacoma; W. D. Humiston, of the Potlatch Lumber Company, Potlatch, Idaho; Huntington Taylor, of the Edward Rutledge Timber Company, Coeur d'Alene, Idaho; T. J. Humbird, of the Humbird Lumber Company, Spokane, Washington; Ben E. Bush, State Forester, Idaho; E. E. Hubert, School of Forestry, Idaho; G. E. Erb of Lewiston, Idaho and F. McGrane of Grangeville, Idaho, repre-

senting a committee appointed by the North Idaho Chamber of Commerce to investigate the need and possibility of protecting the Idaho white pine belt from blister rust.

One day will be spent at Daisy Lake and one day at Cheekye, in order that sufficient time may be available to examine the effect of the rust on white pine. The party will return to Vancouver, B. C., on Wednesday night, May 23.

BLISTER RUSTERS TO THE FRONT

E. E. Hubert, Collaborator.

The School of Forestry at the University of Idaho recently held an attractive exhibit of its activities on the Moscow campus. In conjunction with students from the mining school and the engineering school, Engineers' Day was put over on May 5, with all kinds of success. The forester's exhibit, consisting of a model cruiser's camp, demonstration of horse packing, a model forest complete with trails, lookouts, ranger stations and logging operations, a fire fighting exhibit and an illuminated forest fire, an exhibit of wood products, dendrology specimens and mensuration instruments, an excellent blister rust booth and a minature model grazing area, won a great deal of interest and comment from the crowds that attended. Prizes of rayon products were given to those guessing nearest the correct age of a large section of white pine trunk. Two cross-cut saws were awarded the first and second in the log sawing contest, while a new axe was presented to the winner of the log chopping event.

"Blister rusters" came in for a big share of work as well as praise and awards during the day. Part of the committee putting the big event over were the following "blister rusters"; Anderson, Whiting, Rowe, Guernsey, Fisher, Hume, Axtell, Krueger, Dodd, Balch, Biker and Cochran. Krueger handled the products exhibits in true Californian style. Whiting handled the sawing and chopping contests in good form, and won first place in the chopping contest with Andy Anderson second. Anderson and Rowe won second place in the sawing contest, and later put on a "matching" contest to determine which one of the two should keep the new cross-cut saw which they won. Rowe got the saw.

The model forest attracted a great deal of attention. The efforts of Balch and Anderson added greatly to the success of this exhibit.

In the evening, outdoor movies were shown, and among these were several reels showing scenes of camping, hunting, and outdoor life in the forests.

(Editor) - Speaking of the blister rust demonstration Andy says, "I did not know that so many people had seen blister rust before - right here in Idaho dozens had seen stuff 'that looked just like that and to think it caused all that damage' ".

A BLISTER RUST TALK BY A LAYMAN.

An invitation was extended to the personnel of the Spokane office by the Hoo Hoo Club to attend their luncheon on April 25, to hear Judge G. E. Erb, of Lewiston, speak on Forest Conservation. Several members of the office attended.

Judge Erb spoke briefly on the fire hazard but did not elaborate on this point as most of his audience were familiar with this problem.

Blister rust was his next topic. He made it clear at the outset that he was speaking as a layman. Yet he has made an intensive study of this disease during the past few months, having been made Chairman of the White Pine Blister Rust Committee of the North Idaho Chamber of Commerce.

Judge Erb gave an accurate description of the life-cycle of the disease. Going into the question of ownership he gave statistics on holdings. He then spoke of the value of the timber threatened. "The country has spent millions on other diseases and pests," he said, "why should we not protect our most valuable forest tree in the largest stand of timber remaining in the United States and particularly in the Northwest?"

EDUCATIONAL DISPLAY AT THE SPORTSMEN'S AND TOURISTS' FAIR.

G. A. Felch.

During the week May 14 to 19, an educational display was shown at the Sportsmen's and Tourists' Fair. The display consisted of specimens, pictures, illustrations of the life cycle of the disease, lantern slides, white pines and wild Ribes. One or two members of the office were there to answer questions and talk about blister rust. Ganoung, Swanson, Painter, MacLeod, Riley, Glasgow and the writer, officiated at different times.

The interest shown was favorable although it was a little difficult to compete with three cougars and a hot dog stand for attention. School children, as well as grown-ups, showed considerable interest and asked many intelligent questions.

The life cycle of the disease and the fact that it will attack only the five-needled pines seemed to strike most people as very peculiar and interesting. A great many, probably twenty-five to fifty per cent, had heard something about blister rust. Some of them were still wondering what it had to do with their black currant bushes which had been removed.

One result of publicity had been that many persons who see a tree of any kind ailing from any cause immediately think it has blister rust.

The majority of people who come to the Sportsmen's and Tourists' Fair are interested in anything that pertains to the out doors. They come there to learn as well as to be entertained, and it is felt that the time and effort spent in educating such people is well repaid.

THAT BLISTER RUST FILM

G. A. Root.

It was with some disappointment to the writer that time did not permit a discussion of the Blister Rust Film, scheduled as part of the program of the last conference of the western personnel. Motion pictures rank high in the scale of educational features and deserve the best thought that can be put into them. Judging from the eastern blister rust films, we of the West should feel gratified in having one considerably superior from a purely blister rust standpoint. Perhaps we should be satisfied, yet I believe there is room for considerable improvement. In my judgment the film should be of one reel. Too much of the present western film is devoted to scenic views; too much time is taken before getting down to "brass tacks". The average theatre owner is averse to taking a two-reel film of an educational nature, and it is through the theatre that the greatest good is derived. He much prefers to show one reel and I find that it can be shown more nearly at the time when desired. In an article appearing in a former issue of the Western News Letter, I mentioned that we were obliged to pay for the showing of the film in one town. This may have been for mercenary reasons. This particular house had been swamped with state and government films in the past and from the interview I judged that these were not looked upon with particular favor.

Conceding that our film should be of one reel we must incorporate as much interest as possible which means considerable action with short snappy titles. Does the subject of blister rust lend itself to these factors? Surely there is interest in depicting the two widely separated host plants of the disease. "Close-ups" of the sporulating bodies in each case and the methods of preventing introduction, further spread and control of the rust, should create considerable interest. The second reel of the western film could be changed somewhat and with certain additions, made into a satisfactory one reel picture.

We cannot hope to get the interest and action such as was shown in a foot and mouth disease film. This disease, rampant in California several years ago, required for its complete eradication the slaughter of thousands of cloven hoofed animals, the greatest number of which were cattle. In some instances these animals were driven into a huge trench, nearly 100 feet long, 13 feet wide and 8 feet deep. In one scene, half the trench was filled with dead cattle, with others closely packed in, awaiting the death dealing bullet of the guards on the embankments. A rifle would be brought to the shoulder, a puff of thin smoke, and the animal would crumple in its tracks. Action! Interest! One could fairly hear the thud of the bodies as they hit the ground.

The idea of motion pictures for widespread publicity is an excellent one. They are being used more and more by commercial organizations to reach the greatest number of people. They take the place of lectures to some extent, which are obviously restricted. The fact that "moving pictures" will be shown does not mean very much in this day and age. The glamour of the name has worn off. They must deliver the punch and interest to "get by". It is true that they will draw crowds of various sizes when shown in the open such as at

carnivals or agricultural fairs. In rural communities, motion pictures are an attraction; they generally draw good sized audiences. They are probably better than an advertised talk or a showing of stereopticon slides. Where a meeting is called primarily or solely to discuss blister rust or some other particular subject, motion pictures should be supplemented by some slides and a verbal explanation.

I find the greatest use of the motion picture is simply to acquaint the general public with the subject of blister rust in all its phases. One cannot expect an owner to go out and dig up his black currant bushes, or put a crew of men in the field to eradicate wild Ribes by simply seeing the moving picture of the same. He must have more information; he must have a personal touch with the authorities carrying on the work; he must get the whys and wherefores first hand. The motion picture simply paves the way.

In the March issue of the Blister Rust News for 1927, an article on the blister rust film appeared entitled "Let's Have a Show". The thought of the article as conveyed to my mind was to have a film primarily entertaining, which obviously would necessitate a well rounded scenario and the employment of professional actors. Such a type as the author had in mind could not be produced otherwise. The author, a member of the eastern personnel, wrote primarily for eastern conditions.

Blister rust information probably, and wisely so, has reached the saturation point in New England. Everyone is fully acquainted with the rust; thousands have seen specimens of the actual damage in the forests. To create further and continued interest, I perceive where some "masterpiece" if possible could be logically considered.

We in the West are far from the saturation point. Distances are too great for one thing and our problem here is comparatively young. I think we could profit best by using a one-reel film, patterned more or less after the News Reel. This could be easily inserted before or after the feature picture of the motion picture playhouse. It should be primarily for instruction and not necessarily for entertainment, yet it might be possible to incorporate both.

We often hear the remark, "East is East and West is West and ne'er the twain shall meet". This does not apply to our problem in general. We all pursue it with the ultimate purpose in mind, to get results. We are bound to use the same fundamental principles. It is only in the application of some that we must diverge.

RADIO TALKS.

As an educational feature of American Forest Week two radio talks were given by the Western Office of Blister Rust Control. On April 25, George Root spoke from Station KGO in San Francisco while on April 28, a talk was given by R. L. MacLeod from Station KGA, Spokane. The history and life-cycle of the disease were explained, with a brief outline of combative measures. No record was kept of the size of the audiences.

A BLISTER RUST YARN

W. A. Rockie

The following story is related as nearly as the writer can recall, in the same words that he heard it. It was told by Bill Tyler of the Kaniksu Boom Company of Priest River, Idaho.

A Blister Ruster was walking along through the woods near Priest Lake one day when he felt a blister rust spore hit his hat. Taking care not to bruise or injure the little spore, he carefully laid his hat in a sheltered place on the ground. Very cautiously he reached into one of his inner pockets and procured that most precious of all instruments, the blister rust locator. He set up his locator, figured the wind velocity and the altitude, and found the source of this spore was located 3 miles and 2,344 feet N 37° 20' W of his present location.

Setting out in the direction and for the distance indicated, he advanced toward his prey. As he neared the location indicated, his advance became more cautious and stealthy so that the rust might not escape him. On reaching the indicated destination, he found himself in a very dense area of brush. His view was almost entirely cut off, but cautiously he looked in all directions, craning his neck first one way, then another. Just as he was about to admit he had made a mistake, he chanced to see the elusive little rascal peeping from behind a Ceanothus leaf.

He cautiously backed away, marking a retraceable trail to the nearest road, and hurried to Priest River. He hurriedly dispatched a rush telegram to Spokane for blister rust shovels. It so chanced that all the Spokane hunters were out after another blister rust, and he could get no one. But the Spokane office wired to Washington, and three men equipped with Sam Browne belts and blister rust shovels took the fastest train to the West, were guided to the hiding place of this blister rust by the original spy, surrounded the varmint and forthwith killed the brute.

QUARANTINE INSPECTION

C. R. Stillinger

Quarantine inspection work was continued throughout the month at all points except Ogden, Utah. The inspector at that point was shifted to Pocatello, Idaho, in April.

During the month eleven violations of quarantine were intercepted. Only one was a violation by a nursery. Six violations of Quarantine 5, of the State of Oregon, were intercepted. Two violations, by private parties, of the Narcissus Bulb Quarantine No. 62 were intercepted.

All inspection work, except that at Pocatello, Idaho, was discontinued by May 1st.

A TALE OF THE RED SPIDER

H. R. Offord

Once upon a time two young men went forth to a greenhouse, where many plants are grown, and planted small Ribes seedlings on sand cultures. After several days of sunshine and storm had passed over the crystal roof of the greenhouse the small seedlings showed signs of awakening. Whereupon the young men provided the Ribes with sweet water and tasty chemicals in order to build up their little vascular bundles. And the young men rejoiced to see their beloved plants grow so tall and strong. Just at this time there came a small but terrible monster known as Red Spider. He was well known to all knights of the greenhouse and great was the despair in the hearts of the young men. Many generations of Red Spider were born on the helpless leaves of the Ribes, the while our doughty knights waged war on the invaders. Liquid sprays and poisonous fumes availed naught against the sturdy foe and soon the plants began to drop their heads with so much sickness. Just when the cause seemed lost there came to the aid of the young men Humidity, that fickle mistress of plant life. Red Spider was vanquished and sounds of victory resounded throughout the glass halls of the greenhouse. Happiness prevailed until a terrible ogre appeared who threatened to destroy completely the young plants.

If, dear reader, your editor will permit it, the story of this new monster will be told to-morrow night.

* * *

Dear Editor: -

The following are a few of the experience qualifications appearing on the application form of a 16 year old farmer lad seeking eradication employment:

"Employer - myself.
Salary - $1200 per year.
Kind of Work - farming on my own ranch under myself.

Experience

Reconnaissance, grazing or timber: Pastured stock two summers.
Cruising: In Monteray Bay.
Flunkying: Flunkying for donkey engine boilers.
Packing, back or horse: I have broke mules."

California Eradication.

NOTES

B. A. Anderson reports that they are working on a plan to eradicate all Ribes within one-half mile of the University of Idaho nursery.

H. R. Offord arrived in the Spokane office on May 18, to commence his field work in Idaho.

* * *

Painter and Peterson joined Goodding at Portland on May 2. They proceeded to the Wind River Nursery and eradicated an area of 1500 foot radius around the Nursery. The armstrong method was used on 141 R. sanguineum and 10 R. odoratum.

* * *

Benedict says, "I recently enjoyed an interesting discussion with Mr. Solinsky of the Ruggles Estate (Dorrington area). He furnished us with a map of the area showing the results of a recent cruise. The board feet volume per acre for the four timber species is shown for each section. Sugar pine is characteristically patchy over the entire district, running 30% and better in patches scattered over the area and falling to 10% and less over much of the yellow pine slopes. Locating and eradicating these patches may prove to be a feasible method of local control of sugar pine areas."

* * *

Frank Patty left for Berkeley on April 23, to prepare for field work on the California ecology project.

* * *

The Cheekye Plot came into its own again this spring. It was re-eradicated by a swarm of blister rusters. Putnam, accompanied by Bedwell, Ganoung and Rockie, drove to Vancouver, B. C., where they were joined by Glasgow, Joy and Simcoe for the voyage to Cheekye.

After re-eradicating the plot, the party examined the young planted pines for infection.

Rockie made the trip to examine the Brackendale plot for ecological data.

The party also went to Daisy Lake to give the Neophytes a chance to see heavy damage by blister rust.

* * *

Percy Bell has started his field work in earnest. We see him in the office once in a while. Riley drove to Bovill on Friday, May 11, to help unload chemicals. He says there were 25 tons.

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BLISTER RUST NEWS LETTER

FOR

STATE AND PROJECT LEADERS

* * *

Confidential

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U. S. Department of Agriculture
Western Office of Blister Rust Control
Spokane, Washington

SIGNIFICANCE OF THE NEWMAN LAKE PINE INFECTION

H. N. Putnam

Facts in the case: in connection with the Newman Lake pine infection, the following facts are significant:

1. Intensive scouting of pines in association with Ribes in all drainages leading into Newman Lake, showed only one infected area.

2. The infection consisted in seven infected pines, all within 200 feet along a creek, and 1 infected pine 1/8 mile from the others. These pines 11 to 20 years old were in association with G. inermis and R. lacustre.

3. Analysis of the 21 cankers found showed that nearly all had fruited twice, on 1922 wood. A few were on 1923 wood. No cankers younger than fruiting for 1st time were found. Evidence was clean cut that infection found resulted from Ribes infection in 1923.

Tentative conclusions: Reasoning from the facts shown above, it is believed that infection resulted from a single aecial hit on Ribes in 1923. No evidence was found to show that infection occurred prior to 1923. That the pine infection resulted from a single aecial hit is evident from the fact that the only pines found infected were located well within striking distance from a single infected bush or clump of bushes.

Judging from the fact that no other centers of infection have been found, evidence is suggestive that the aecial source of the infection is probably some distance away.

The probable history of the development of this infection is as follows:

Summer 1923: Ribes became infected and caused pine infection.

Fall 1924, Spring 1925: first symptoms on pines showing.

Late spring 1926: pycnia formed.

Early spring 1927: most of the cankers produced aecia for first time. A few cankers probably produced 1st aecia in 1926.

Spring 1928: most of cankers produced aecia in abundance, 2d year of fruiting.

No cankers younger than fruiting were found. Doubtless a few such cankers occur, but since aecia were produced in fair abundance only last year, the main body of resulting young cankers will not be visible until next spring.

While we have insufficient evidence at hand to make a very confident estimate as to blister rust conditions in Idaho, it seems logical to expect numerous small infection centers similar to the Newman Lake infection at various points in the white pine belt. We know that 1923 was a good year for the rust to spread on Ribes. At 2 of the 3 infection centers near Nelson, B. C., evidence points to 1923 as the year of first infection. It is quite conceivable that the rust hit G. inermis and R. petiolare at various out-of-the-way points where pines were in close association, and caused pine infection. The year 1927 was another good year for the rust to spread. The fact that only a relatively small amount of Ribes infection was found, might indicate that aecia from cankers produced as a result of the 1923 wave of infection were too few in numbers to cause extensive Ribes infection.

Suggestions for future work: the situation calls for an intensive and vigorous scouting campaign over the entire white pine belt. The following principles should govern:

1. Scout the country systematically by drainages.

2. Scout associations of R. petiolare and pines; G. inermis and pines, very intensively.

3. Scout concentrations of R. petiolare and G. inermis within the western white pine belt.

4. If infection is found, scout all associations of pines and Ribes species in that drainage.

5. In spring devote attention to pines only in association with susceptible Ribes species.

6. Late summer and fall scout susceptible Ribes in association with pines. If Ribes found infected, scout all pines in vicinity.

7. Gradually build up map showing all associations of pines and R. petiolare and G. inermis. Such spots constitute good areas for yearly inspections.

NOTES FROM CALIFORNIA

G. A. Root

The field season in California opened in late May, when the control reconnaissance camp was established and work started near Quincy in the Plumas National Forest.

The local control camp was set up near Dorrington in the Stanislaus National Forest, and some preliminary work done prior to June 1. The first contingent of men arrived June 2, to be followed by the remainder on June 9. At this time it is expected the work will be going with full steam ahead.

Frank Patty, who had been helping Benedict in the local control work, started his ecological work on Ribes around the first of June. The first of the studies will be conducted near Strawberry in the Stanislaus Forest, the site of the 1927 local control project. This is favorable ground for such work because of large areas of cut-over land.

The black currant eradication work started June 1, with one man in Kern County. This is about the southern extremity of the range of sugar pine in the Sierra Nevadas. Five other men will report for work on June 15th and 22nd respectively. Their activities will be centered in several of the coast counties.

SOME GENERAL OBSERVATIONS ON RIBES

S. N. Wyckoff

The following notes, gleaned more or less at random from Janczewski's Monograph on Ribes, may be of interest to all tried and true blister rusters. To those of us who are engaged upon intensive work with the Ribes of a rather restricted region there exists an ever present danger that our attitude toward these plants may become too narrow. We may come to think that the site conditions in which we constantly see the Ribes of our particular part of the world represent the optimum for the group as a whole. This may be far from the truth. For instance, a person who studied the Ribes of the inter-mountain plateau region, but knew them nowhere else, might easily come to the conclusion that Ribes as a whole were semi-xerophytic plants. In reality, they primarily inhabit moist, cool regions, and less often adapt themselves to the semi-arid conditions existing in southwestern North America. Such a belief might well form the basis for some erroneous conclusions regarding Ribes in general, or even the local species of the semi-arid region.

According to Janczewski's taxonomic treatment, there are 133 species of Ribes in the world. Of these 133 species, 58 are dioecious, that is, they have the pollen-bearing stamens in separate flowers and on separate plants from the seed-bearing ovaries. These dioecious species occur only in South America, Asia and Europe.

There are 9 species occurring in Europe, 2 in Africa (found only on Mt. Atlas), 45 in Asia, 46 in North America and 40 in South America. Of the 46 species occurring in North America, only 3 are found elsewhere; Ribes triste, R. laxiflorum, and R. lacustre are found in eastern Asia.

R. magellanicum, occurring in Tierra del Fuego, South America, has the most southerly distribution. R. triste occurs farther north than any other species, at a latitude of 73° N., along the borders of the Boganida River, Siberia. R. viburnifolium, R. tortuosum, and R. speciosum, as they grow along the coast of Lower California and Mexico, can, in the opinion of Janczewski, withstand greater heat than any other species.

The above are but a few of the many interesting observations to be found in Janczewski's Monograph.

IT IS BEST TO GET THE FACTS FIRST

L. N. Goodding

Some years back, Professor Longyear of the Colorado Agricultural College and myself took some time to measure and photograph some very large Pinyon pines in Northern Colorado. The great size of the trees and the extremely slow growth of the species generally, led me to assume that the trees in question were very old. In fact, as a result of counting the rings on some trees two to three inches in diameter, I estimated the age of our largest trees to be about three thousand years. I was free enough in expressing my opinion to get quoted in a Ft. Collins paper although I did not seek such publicity. A few months ago I asked Professor Longyear to have students take borings of some of the large Pinyons to determine accurately their age. On doing this, he found them to be six or seven hundred years old. The moral of this narrative is not hard to see. If you investigate carefully before you talk, you may not have so many thousand years to back up.

QUARANTINE INSPECTION

C. R. Stillinger

Quarantine inspection was carried on at the usual inspection points in the West during March and April except at Seattle. At this point inspection was continued throughout the winter. The period was divided for one inspector between Ogden, Utah and Pocatello, Idaho, the work being closed at Pocatello on May 15.

The summary of violations for the spring period is given in the following table, classified according to the class of shipper, means of transportation, and content of shipment.

Quarantine Violations

Shipper	Transporting Agency	Federal No. 63		State	
		Number Violations	Number Ribes	Number Violations	Number Ribes
Nursery	Parcel Post	7	67	8	83
	Express	7	250	7	142
	Freight				
Individual	Parcel Post	15	91	11	24
	Express	1	8		
	Freight				
Total		30*	416	26	249

*One violation reported from St. Paul.

Violations Federal Quarantine No. 63	- 30
Violations Oregon State No. 5	- 15
Violations State of Washington Order	- 11
Total	56

Federal Violations by Nurserymen	-	14
Federal Violations by Individuals	-	16
State Violations by Nurserymen	-	15
State Violations by Individuals	-	11
Total		56**

**No shipments of black currants or white pine were observed.

During the period of inspection in the West, a record was made of Ribes shipments observed in transit. The data for this season indicates that the period of Ribes shipment in the spring is during the last three weeks of March and first two weeks in April.

It is also of interest to note the means of transportation for the 185 cases recorded of shipments containing Ribes. A summary of this phase of the observations is given in the following table:

Means of Transportation	Shipments Inspected		Shipments containing Ribes		Violations	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Parcel Post	34,692	78.3	146	78.9	39	71.8
Express	9,112	20.5	37	20.0	16	28.2
Freight	510	1.2	2	1.1	0	0.0
Total	44,314	100.0	185	100.0	55	100.0

This table indicates that the number of violations through any means of transportation is directly proportionate to the number of shipments examined. In other words, the means of transportation which offers an opportunity to inspect the greatest number of packages will give the greatest number of violations. Parcel post offers the best opportunity for inspection because it offers the greatest number of packages which can be easily concentrated and inspected. The conclusion is drawn that if the Federal inspection is to be only a sampling process and not complete inspection, the importance of any inspection point should be determined according to the amount of parcel post it is possible to inspect at that point.

PINE INFECTION IN OREGON

On May 30, blister rust was found by Goodding on two white pines about two miles east of Palmer in Multnomah County, Oregon. Scouting in the limited amount of white pine in this vicinity failed to locate any more infected trees.

One tree had one canker, the other had six. All of the cankers but one were on 1923 wood. The one was on 1922 wood. All of the cankers fruited for the first time this year.

Both infected trees were in close association with R. bracteosum. No infection was evident on the R. bracteosum at that date but will probably appear later even though the cankers were all cut out.

The locating of this pine infection brings the blister rust threat much closer to the sugar pine of southern Oregon. Intensification of the rust on pines in the Mt. Hood region will be followed by a wave of the disease farther south in the Cascades. We hope that this pine infection is, or was, the only one in Oregon. The nearest known pine infection to this, is at Spirit Lake, north of Mt. St. Helens. It seems that the time of a scouting crew might well be spent in southern Washington to determine more accurately the position of the enemy.

OREGONIANS

L. N. Goodding.

Goodding found blister rust on pines in Oregon on Memorial Day, the purpose being to make the day significant.

Work on stink currant eradication at the Wind River Nursery starts June 16. Simmonds, our old cook, back on the job assures excellent food if not excellent work.

Pop Stone was taken to the Emmanuel hospital in Portland recently, suffering from ulcers of the intestines. Last reports are that he is rapidly improving. He hopes to hang out his dentist shingle soon.

Notice of blister rust found in Oregon occurred in "The Oregonion" and "The Journal". The fact was mentioned to several farmers lately, and ninety per cent had read it "in the paper". Several scientific men were told of it and about fifty per cent had read it "in the paper". Who reads the newspaper?

The last Blister Rust News for May had no item from the West. Snap out of it, gentlemen. The West is entitled to an Associate Editor, and the Blister Rust News is entitled to notes from the West.

Mrs. Philip Brierley, nee Shireman, late of Washington, D. C., now of Corvallis, Oregon, is secretary in the Blister Rust Office at the College.

NOTES

Blister rust field work is in full swing. All camps have been established and the boys are preparing to tear into it.

* * *

Professor J. N. Spaeth, Research Professor of Forestry at Cornell University, has come to the Spokane Office to study the relationship between pine foliage and canker development. He and Putnam have returned from a trip to the infection centers of the Upper Skagit, Olympic Peninsula and Spirit Lake. They leave again on June 17 for the Coast where a comparative study of P. strobus and P. monticola on the south fork of the Stillaguamish River will be made.

* * *

Frank Patty reports 3 inches of snow at his ecology camp. It was still coming down when he wrote. We hope that it was soon dissipated by the eternal sunshine.

* * *

Bill Painter spent two days in the hospital last week, following an operation on his nose.

* * *

S. N. Wyckoff left on June 12 for Missoula where he attended a meeting of the Regional Forest Protection Board.

g. F.M.

Vol. 3 July 15, 1928 No. 7

WESTERN BLISTER RUST

NEWS LETTER

* * *

Summer Issue No. 1

* * *

U. S. Department of Agriculture
Bureau of Plant Industry
Western Office of Blister Rust Control
Spokane, Washington

WESTERN BLISTER RUST CONTROL PROGRAM FOR 1928.

S. N. Wyckoff

The following is a brief account of the projects which the Western Branch of the Office of Blister Rust Control has under way for the field season of 1928:

1. Ribes Eradication.

Several different types of Ribes eradication have been undertaken for the present field season. These vary to a certain extent according to the purpose of the work and the local conditions encountered on the ground. One type is for the protection of forest nurseries and arboretums. The purpose being to safe-guard stocks of white pine to be used for future planting and valuable collections of growing white pines. In this type of work it is vitally necessary to secure 100% protection. This is only possible by 100% Ribes eradication over an area sufficiently large to absolutely preclude the possibility of infection. As a basis for this high degree of protection Ribes are to be eradicated for a zone 1500 feet in width around the nursery or arboretum and the heavy concentrations of susceptible Ribes in the stream type are to be eradicated for a zone one mile in width.

The Savenac Nursery at Haugan, Montana, where white pine stock for planting on the national forests of District 1 is grown, is being protected this year. This is very largely a job of stream type eradication, as very few Ribes are found on the slopes near the Nursery. A combination of hand pulling and chemical eradication is being used. In addition to the purely practical aspects of the work, many valuable experimental data are being secured regarding the proper relation of hand and chemical eradication.

The Wind River Nursery near Stabler, Washington, is also being given protection from white pine blister rust. This Nursery contains a limited amount of white pine stock and a valuable arboretum containing numerous exotic species of white pine. Ribes eradication outside of the stream type was done early in the season. The principal job was to secure the eradication of a relatively small number of Ribes sanguineum bushes. Eradication early in the growing season simplified this work because of the high visibility of the bushes during the period of blossoming. Stream type eradication started later and is now under way.

Representing a slightly different type of work, cooperative local control is under way this year for the first time on what is known as the Big Creek area north of Priest River, Idaho. The work is being cooperatively financed by the State of Idaho, Priest Lake Timber Protective Association and the Federal Government. This is largely a job of Ribes eradication in the stream type and the reproduction type, as much of the mature timber contains very few Ribes.

Experimental work on local control is under way at a number of points. Two camps are being operated on the Coeur d'Alene National Forest of Idaho, one on Picnic Creek and one on Marie Creek. The work on Picnic Creek is

primarily designed to determine the cost of stream type eradication in a drainage of mature timber. The general scarcity of Ribes in mature timber is such that stream type eradication will give adequate protection to the area.

The work of the camp on Marie Creek is primarily devoted to intensive studies of eradication methods. Numerous experiments are there being made, the results of which will tend to lower the cost of Ribes eradication.

On Lamb Creek, on the Kaniksu National Forest, a small unit is experimenting upon the cost and necessity of re-eradication. This area was the scene of experimental Ribes eradication in 1926. The present experiment will determine the amount of re-growth and re-entry of Ribes since that time and the cost of eradication of these bushes.

An extremely interesting experiment of joint hand and chemical eradication is under way at Bovill, Idaho. The experiment consists of Ribes eradication in all of the stream type of one-half of a township. Both hand pulling and chemical methods are being used, altho, because of the large concentration of Ribes in the stream type of this area, a large proportion of it is being eradicated by chemical means. The results of this experiment will help to answer the following questions:

1. What percentage of the land in a given forested area consists of stream type?
2. What is the relation of areas of stream type found in a half township by the eradication forces and by reconnaissance?
3. What is the cost of stream type eradication per section or per township of forested areas?
4. How high a degree of concentration must Ribes reach in the stream type before it is more efficient and less costly to eradicate them by application of chemical and by hand pulling?

Further experiments in both hand and chemical Ribes eradication will be made on what is known as the Still Creek area, Mt. Hood National Forest, Oregon. The Still Creek area was heavily burned a number of years ago and has since been planted by the Forest Service, part of it to white pine. Work in this vicinity is to determine the cost and feasibility of Ribes eradication under the conditions found in the Cascade Mountains. Experiments in chemical eradication are to be carried on and will result in information regarding the susceptibility of Ribes bracteosum to eradication by this means.

Experimental Ribes eradication in California for this year is being conducted near Dorrington on the Stanislaus National Forest. This National Forest is considered by the Forest Service as lying within the optimum range of sugar pine. It is therefore, imperative that the cost of Ribes eradication under the conditions encountered in this region should be determined.

Intensive experimental work on chemical eradication necessarily takes

on a dual form. Laboratory work is necessary to determine the fundamental action upon the Ribes plants of the various types of chemicals which are being experimentally applied in the field. In addition to this work small scale applications of numerous chemicals are each year made to Ribes in the field. The application of each chemical is made upon a sufficient scale to determine its effect upon Ribes, but untested chemicals are not used as the basis for extensive field work until they have been given sufficient preliminary tests.

Laboratory work on chemical eradication is being conducted at Berkeley, California, in cooperation with the University of California. Field experiments are under way at Santa, Idaho, Still Creek, Oregon, as mentioned above, and Strawberry, Stanislaus National Forest, California.

(To be concluded in the August issue.)

SPRAYIN' GOOSE-BUSHES

R. P. d'Urbal

The philosophic old P. L. Co. track-walker had just replaced a worn-out tie. He met the engineer at the watering tank, and after a few bland remarks turned to the blister rust boys:

I was passin along on my beat 'bout nine this mornin. I heard a helluva noise above, and I looked up athinkin it was some deer in the brush. I saw a couple of them thar college kids, one of them a rollin down the hill with a tank and a long poke-thing comin tearin after him. The other kid just laughed and kept on pokin at fruit bushes with a sort of drawn-out sprinkler. The kid finally got up, cussed like a gentlemen, rubbed his side, laughed and came down the hill. He didn't have a shirt on and his jeans was stagged off around his knees. The college kid stopped at his pup-tent. Let me tell you thar was enough stuff chucked thar to blow Tuolumne County off the map! He got another load of stuff. He mixed it up and I watched him. Being somethin of a boozer myself--them concoctions interested me, Pete. First he adds some white dope and mixes the stuff up and got a brew as cold as Angel Camp beer. Then he dumped in some stuff (he said they used it to keep down the dust). And in a jiffy the stuff was as warm as old Sonora itself.

Every day I see them thar sprayin fools pokin at fruit bushes.

INFORMATION WANTED

W. A. Rockie

During the present week, a plant of R. viscosissimum was found layering at two points on the same stem near Harvard, Idaho. The writer has watched this species carefully for six years, and this is the first instance of which he has learned.

Will anyone who has seen this condition please get word to the writer through his project leader?

CALIFORNIANS

George A. Root

The blister rust personnel of California wish Bill Painter a speedy recovery from his recent mastoid operation. The writer underwent a similar operation three years ago and can sympathize with our friend Bill.

The local control camp at Dorrington has in the person of Mrs. Davis, camp cook, a trained nurse. Her ministering hands have more than once poured a soothing lotion over cut and bruised hands and tied many a bandage on infected hands and fingers. Uncle Sam, by the way, has been saved not a few dollars by Mrs. Davis' kindness.

Frank Patty says he likes the California mountains as well if not better than those of Idaho. The California bug is fast getting in its deadly work. It'll make a native son of him yet. Attention, Steve!

The presence of black currants (the fruit) in the Oakland market caused a furor of excitement in blister rust circles. Speedy investigations revealed it was the fruit of R. aureum and peace again reigned on the firing line.

Next! Idahoans, Washingtonians and Montanans.

RIBES

There are Ribes in the mountains,
We find them near the creeks.
It makes no difference where they are
They're always tough as bricks.

When we start to pull them
And they stick and stay,
No, it doesn't make us angry
But I know that we don't pray.

If my memory doesn't fail me
I think we start to swear,
But the Ribe doesn't heed us
For it seems to stay right there.

Now I wonder if the Ribes knows
That cussing isn't might,
For when we pull together
It doesn't show a fight.

I believe it is the tugging,
And not the way we swear,
That makes the Ribes come right out
Instead of staying there.

Jorgenson Camp #2

A BIT OF HEAVEN FOR BLISTER RUSTERS

B. A. Anderson

You blister rust men of California, Oregon and Idaho--did you ever put up a blister rust camp when it wasn't raining? For three years every time I have hoisted the center pole of a pyramid tent into place, little streams of moisture have been trickling down my back and filling my sodden boots.

But this year history failed to repeat itself. When we arrived at Big Creek in northern Idaho, we found one of the most modern lumber camps in this section of the country at our disposal. Clean, roomy bunk-houses equipped with electric lights, showers, hot and cold water, and a fine wash room are some of the comforts we are enjoying in lieu of the airy freedom of a pyramid tent.

Can you imagine with what satisfaction I wrote - six 25-watt light globes - on a requisition the other day instead of - 1 gal. of kerosene and six sets of candles? They haven't arrived yet, perhaps Roy Calhoun thinks that toothpicks and electric light globes are in the same class.

The boys can't get used to hearing the beat of rain on a shingle roof. Whenever we are awakened by the roar of thunder, we listed tensely for the patter-patter of the rain on tightly stretched canvas and then peer cautiously over the edge of the bunks half expecting to see a puddle of water collecting on an earthen floor.

We are afraid, though, such luxuries do not fit in well with the hard-boiled tales of the flea-bitten old timers--but while it does, our hats are off to the Diamond Match Company.

6:30 A.M.-12 M.-5 P.M.

Mrs. C. A. Owyens, who is flunkying for the Blister Busters at the Big Creek camp has her two little sons with her. The other day Freddie, aged three, was heard to remark to his mother, "Mama, hitta bell, -wanna see the men run."

BLISTER BUSTERS

The new man had just been introduced into the mysteries of the blister rust by the old timers and was dizzily gasping for air.

"Do you really have to furnish your own hammers to bust those blisters?"

Camp 1 - Idaho

DOT RECONNOITER CHOB

Vos a cabin in a meadow
At de head of Seelver Crik
Und dey call it Casey's Cabin
Mein Gott, it make me seek.

De no-see-'ems and moskeeters,
Mein Gott, how dey do bite
Dey bite me in der daytime
Und dey bit me in der nite.

De Seelver Crik, she run so smooth,
De feesh, she are so dumb,
You drop a hook, der vadder in
Und catch dem vun by vun.

Our compass und our tally-vacker,
Ve mitt us take vun day
Und look all round for section line
Der time to pass avay.

De animals, she are so tick,
Van day ve get der scare,
Ve hear a crackling in der brush,
Und tink she iss a bear.

Ve got our peestil from our pocket,
Der sight ve get in line
Ve see der tam ting through der bush,
She vas only porky-pine.

Ve go ouid to vork der section
Tink ve know were ve begin,
But compass, she point der odder vay,
And ve don't know vere ve end.

Der hill ve vander up and down
A trail ve finally found--
Ve vandered up der trail a vays
Und vent der hill around.

Ve met a bear der hill around
Mein Gott, ve get der scare
Ve turn around mitt planty haste--
Back to camp ve aire.

So now you know just vat it is
Dis reconnoiter vork ve do.
Ve tink she is van tam find chob
Und tink you like him too.

Libby and Lusk
Clearwater Reconnaissance

HAIL STORM DOES DAMAGE TO SAVENAC NURSERY

It is expected that 1,000,000 trees will die or be so badly deformed as to be a total loss, as a result of the recent hail storm at the Savenac Nursery at Haugan, Montana, according to D. S. Olson, Chief of Planting.

Hail stones about the size of cherries fell ankle deep in some places about the Nursery, preceded by a heavy shower. The hail storm was followed by a cloudburst. An area about five miles wide was affected, with the Nursery in the center.

The total extent of the damage can not be estimated as it is impossible to determine how many trees will recover from the whipping administered by the hail. One hundred thousand trees sown this spring in one spruce bed were entirely covered with mud and silt and will be practically a total loss.

Comparatively the damage is not so great as there are from 10 to 12 million trees on hand at all times. The number damaged represents a reserve supply which is maintained for just such unforeseen losses. The damage was greatest, however, to the older stock which should go out for planting next spring.

THE IDAHO SCHOOL OF FORESTRY ERADICATES CURRANTS AND GOOSEBERRIES FROM ITS WHITE PINE

Percy Rowe.

Under the direction of Dr. E. E. Hubert, those students who have had practical work in blister rust control have eradicated all the Ribes from the forest nursery and arboretum.

The Forest School nursery and arboretum, consisting of about twenty-five acres, together with an isolation strip of over nine hundred feet, were gone over from two to three times and so should be practically Ribes-free.

The areas were first reconnaissanced, and then three crews of five men each were organized. These crews ran strips back and forth, pulling all Ribes as they were found. A total of 480 Ribes bushes were eradicated. The species found were, for the most part, Ribes lacustre and various species of cultivated currants.

The following men took part in this work: Crew No. 1--Bernard Anderson, Rex Wendle, John Hume, Wallace Saling, and Prentice Balch. Crew No. 2--Percy Rowe, Wellington Seymour, Cyprian Taylor, William Mitchell, George Illichevsky, and Allan Cochran. Crew No. 3--Holt Fritchman, Virgil Moss, Harry Whiting, Fred Kennedy, Philip Lord, and Charles Gregory.

RE-ERADICATION

C. O. Peterson.

Work on the re-eradication project is progressing nicely and we are finding some very interesting data in spite of lots of rainy weather and many vicious, bloodthirsty insects.

One hundred and thirty-nine acres were re-eradicated in June. On this area we found 4,862 Ribes, divided by species as follows: 2,330 G. inermis, 1,578 R. viscosissimum, 954 R. lacustre.

On a 7½ acre special study plot, in stream type, part of which was burned over in April 1926 and eradicated that summer, we found 1,060 Ribes with live stem of 2,215 feet and leafbearing stem of 1,164.5 feet. Nine hundred fifty-six were G. inermis and 104 R. lacustre.

Of these 1,060 bushes, 173 were sprouts from bushes that had been burned off. Thirty-nine were sprouts from bushes which had been pulled but not properly hung up. One hundred seventy-three were from broken-off crowns by the first eradication crew. One hundred eighty-seven were mature bushes that the crews had missed. Four hundred eighty-eight were seedlings which germinated as follows: 36 in 1926, 363 in 1927 and 89 in 1928.

In view of the fact that this area in 1926 had approximately 6,000 Ribes on it with live stem of 187,500 feet the degree of protection from blister rust infection is relatively high. Although we find 1/6 as many Ribes on the area, the live stem is only 1.17% as great as before the first eradication.

DAILY ROUTINE OF RE-ERADICATION

R. V. Thompson.

"Roll out! Daylight in the swamp!" The reveille of the Ribes hounds rumbled from Pete's hairy chest and echoed among far-distant mountains.

"Damn", says Shorty Tallman, as he crawls out of warm blankets and oozes into cold boots and damp shirt. The rest of the re-eradicators agree, for this is November, judging by the weather. Out of each twenty-four hours, not less than three and oftener ten or twelve are reserved for rain only. When the rain stops we don our diving suits and an air of resignation, and march solemnly but not silently into the slimy swamp or up the weeping mountains.

The first step into the brush sends a swarm of ravenous skeeters, deer flies, gnats, and "no-see-ems" buzzing harmfully about our ears, while each succeeding step only adds to the multitudes of our tormentors. Bandanas tied about our necks and liberal coats of oil of citronella, sheep dip, and various other anti-mosquito lotions fail against the vicious attack of these bloodthirsty insects.

"Don't sit there and bark at me, you big coward", yells Bus Gorman, little knowing the effect his taunt will have. As he speaks, the little undersized mosquito, which is sharpening his needle on a cedar log and licking his drooling jaws in delightful anticipation, rises in the air with a vengeful snarl and roars straight at our comrade's throat. Bishop, a self-sacrificing hero, raises a knotted club--which he carries for the purpose--and with a mighty blow behind the assailant's left ear, felled him with a crash. (The hide is now drying on the cabin door if the curious wish to verify this statement.)

At eleven o'clock we stop to dress the wounded; Smithburg alone remains unscathed. He packs a six gun. Don Waldo, the foreman, never says a word, tho his hurts are grievous. Throughout the day we frequently find curiously formed skeletons and odd shaped bones which have been picked clean by the coyotes. "Those," said Bishop, who worked here before, "Are the skeeters the crews killed in 1926. Some babies, eh?"

At this minute our folks are writing "--I know you are having a pleasant time in those beautiful mountains. Wish we were with you"!!!

"METHODS"

Now just as perchance,
You may all look askance
At the methods you see us pursue,
As we tear thru the brush
Kicking up such a fuss
Here and there checking Ribes on you.

We follow your wake,
Length of live stem we take,
Now and then turn the stop-watch on you;
When you dig with the pick,
Run the strip small or thick
We're there with the watch and line too.

When you make a bad break
Or a fiver you take
And you think we write down notes on you;
Just don't have a care,
Cause we're really not there
To make any trouble for you.

Now just as perchance,
You may all look askance
At the methods you see us pursue;
Don't start to suppose--
Good Heavens! Who knows?
It might mean more profits to you.

Dykeman.

FROM THE OREGON FAUCET

The Oregon Muse is not working this month and Paul Bunyan took one look at the stink currant up the Wind River way, decided melting saws in big fir trees was a lot easier than stink currant eradication and drifted on to Seattle. Possibly you fellows have read from time to time the opinion of experts on this thing and that. Possibly you have been among the gullible. Take a bit of advice from an expert, the value of an expert's opinion is in direct proportion to the time he takes to investigate a matter. To shorten my speech, Goodding and Strong didn't know a few months ago what a devil of a mess of stink currants grew near the Wind River Nursery. Goodding does at the present writing.

Bill Hornibrook has signed up with the Forest Service. The land to which he goes abounds in yellow pines, trout, deer, turkey and Mormons. It is the land of romance. Each year Zane Grey goes there to hunt bear and "novel" ideas. It is also the land of the wild and wooly Apache. Even to the present day "heap big chief" may be seen regaled in a new suit of tight-fitting underwear proudly riding his mustang in pursuit of some unruly steer, but he (the Indian, not the mustang nor the steer) is about the most peaceable person on earth. Our good wishes go with Bill to the Sitgreaves National Forest in Arizona.

Hornibrook and Goodding took out the pines in the blister rust infection area in Oregon a short time back. Oregon has such a few pines that it is an easy matter to look them up and take them out as soon as they become infected.

Prof. Lawrence recently collected specimens of Grossularia nivea just east of the Cascades in Oregon. This greatly extends the range of this species. According to Lachmund's investigations, it is extremely susceptible to blister rust.

Hey, Bill Rockie! We are finding plenty of Ribes bracteosum seedlings this year. And Ribes sanguineum seedlings at the rate of 150 or more in a single bunch. The huge bunches seem to come from mice caches.

Not one R. lacustre bush has this far been encountered at the Wind River Nursery. Some of you wise guys please state the reason why.

. . .

Mr. Putnam, were you the fellow who said you had difficulty in finding R. bracteosum in the neighborhood of the Wind River Nursery when you were inspecting there last summer? Well, we have a few places where we are leaving them for your special benefit this season. What is more, there are some excellent associations with white pine.

THE BRACTEOSUM SITUATION IN STILL CREEK AREA, OREGON

Ribes bracteosum is most persistent in its struggle for existence against unfavorable environmental factors and against the efforts of the boys to exterminate it by muscular means.

We have found in the areas eradicated along Still Creek that "bracty" has been rejuvenated with vim and vigor. Numerous sprouts have appeared from old stems which escaped the eagle eyes of the crew and from stems or roots buried deep in the mud. The presence of the stems from which "bracty" is sprouting, however, cannot in most cases be laid to carelessness on the part of the boys. The Beaver also working along the stream tricked the eradicators by cutting off the bushes close to the ground and leaving nothing by which to identify them except small stumps. These stumps along with the pieces of stems have sprouted vigorously.

"Bracty" has still another come-back. The method I refer to here is by seedlings. These have come up in large numbers in the areas stirred up in the process of eradication.

An experiment to determine to what extent "bracty" would layer was set up in a typical bracteosum habitat, i.e. a very wet draw. The bushes were pulled and portions trampled into the mud or partly buried. We found that out of the number of plants tested, about 34% had taken root and 10% had sprouted.

The growth and reproduction of "bracty" does not seem to be much inhibited by shade conditions except in the quantity production of fruit.

From these observations it seems that we shall have to make further studies of Ribes bracteosum.

Oregon Eradication.

* * *

The boys had heard the dinner gong and the dust from the stampede was settling gently on the delicious dinner in front of us. Amid agonizing cries for service from fellow strugglers, we heard a heart broken groan and looking up, we saw Jim Thomas sheepishly trying to turn his plate right side up after he had delivered half of the contents of a bowl of slum gullion onto the back side of said plate. Such things do happen!

Camp 1 - Idaho.

GLASGOW MAKES GOOD AS COOK

The day our first cook broke his leg (wooden) and went back to town, all of us were living in fear of going to bed without any supper. However, when quitting time came and we arrived in camp, whom should we find gracing the kitchen but Aaron himself. Then our fears grew as we thought of what his cooking might do to us.

When the gong sounded, we all gathered around the table and cast suspicious glances at the food. Soon, however, the pangs of hunger overcame our fear for the welfare of our digestive organs, and one after another we "fell to" regardless of consequences.

Half an hour later, we had cleaned the kitchen of the last vestiges of food. Then the bunch gathered around and unanimously elected Aaron our cook at a large increase in salary. The only "fly in the ointment" was that he wanted twice as much as we could give him, so we had to be content with him as camp boss. However, he consoled us to a certain degree by getting a good cook, and a flunky for good measure.

Camp 2 - Idaho.

Camp #2 has been very successful with its snipe hunts. That is, we have some very apt students. Charles Ladd went out on one expedition and now he feels he is qualified to lead a party of his own.

Ladd told us that he had gone on many hunts back east but the method of hunting had been of a little different nature. However, we believe he likes our way better. We hope he takes a compass along with him next time, for it took him over two hours to get back to camp when he went on his first expedition.

One of our enlightening qualities up here at Camp #2, is the desire of every man to uphold a high standard of cleanliness. In fact, so strong is the pride of each individual in this established tradition that shortly after camp opened this season, we escorted Johnson and Keyser (two new members who had come to the table unwashed) to the creek and gave them a thorough cleaning. The effect was marvelous. Now, strange to say, everyone strives to be first at the wash stand, and when the gong rings, we are clean to the last man.

* * *

There was a young man from Missoula,
Hired out as a Ribes bush pulla.
He learned how to swear,
That a flush beats a pair
Now he's ready to land in the coola.

Dear Editor:

You Spokanites might be interested to know that it snows in California in the summer time.

After a week of weather ranging from 104 to 110 in the valley, things took a sudden change. On the afternoon of June 10 it began to snow. For several hours it melted as fast as it fell but after the ground became chilled, snow started to lie on the ground, reaching a depth of several inches.

The Blister Boys, many of whom had never before been in a snow storm, enjoyed a day of strenuous snow fights. One work day was lost as a result of the storm. So was the mess tarp. Our Sibley's were welcomed for once. It is still mighty cold but no snow remains.

Ribee Will

ECOLOGY-COOPERATION

W. A. Rockie.

In making the plans and report of the ecology project for 1928, the writer has studied the ideas and suggestions of other members of our personnel for the improvement of the project.

There have been incorporated into the report as a part thereof, all suggestions and ideas which it appeared advisable to include.

Tracing these suggestions back to the originators, it is found that the year's plans include the definite suggestions of at least 28 different men and women who are members of the permanent personnel, of 7 different men of the summer personnel, and of 7 men who are not connected with the blister rust work.

This project is always open to suggestion, so if you have any ideas regarding the ecology project, they will always receive consideration.

The writer desires to express his appreciation to those co-workers who have offered suggestions towards shaping the work of the project.

* * *

Camp #2 has the distinguished biologist, Mr. Carvel Gynn, in its midst this year. Carvel is one of those chaps who is always catching bugs and putting them in glass jars to kill them for mounting. The rest of the boys feel sorry for the bugs, but they feel a darn sight more sorry for themselves, because Professor Gynn stays up until midnight to see that the bugs die properly. If the "Prof" doesn't quit keeping the boys awake, we are going to put him in a glass jar and see that he dies properly.

BLISTER RUSTERS AT HAUGAN, MONTANA

The hail storm of last week knocked 25% of leaves from the Ribes, adding at least that per cent to the difficulty of the work. Camp Supervisor McMacken wore a path around a snag on Dry Creek dodging hail stones. "Not very dry," said McMacken.

Calvin Pearce of the chemical crew on June 29 suffered severe burns on his lower limbs when the chemical on his pants ignited from a spark from the fire built to dissolve soap. A water hole nearby prevented more serious injury. A letter from St. Patricks Hospital, Missoula, as we go to press, reports that he is doing nicely and is anxious to get back on the job.

The Nursery phonograph is now installed in the bunk house.

Boys not thoroughly convinced that we have all stream type are inclined to call it "dammed swamp type."

One more qualification needed by new chemical men: Height - to be visible in mud and brush.

One of the hands falling into creek above boot-tops and rushing into camp at noon for dry socks, produced a series of ha ha's from the "Beavers" - chemical eradicators.

We have an electric light plant and an automatic cutoff. Also many sore toes.

Our Montana camp is at the Savenac White Pine Nursery. A ranger station is also located on the same ground. Supervisor Jones and Ranger Hauer have more than made good with boys due to their many acts of assistance and articles of comfort. We hope we may be able to repay them in some way.

A three-cornered indoor league has been organized consisting of Savenac (nurserymen and fire fighters), Beavers (chemical men), and Hodogs (handpullers). Two hot games were played Sunday p.m. Savenacs won from Beavers 6-4 and Hodogs won from Savenacs 9-2. The third game of the weekly contests will be played Wednesday evening between Beavers and Hodogs.

Childs should be in the navy as he has two gunboats along this summer. As one of the fellows suggested, they are not fairy boots but fairy boats. We can't blame Ed though, he went to a Jew shoe joint in Spokane and on account of the fact that they were two sizes large, he talked the proprietor into a four-bit reduction. Furthermore, he was satisfied, because he reckoned they might shrink.

The most lost person we have yet seen in the crew is Ed Childs who gets out in a tangled maze of brush with a pedometer in one hand and a compass in the other and yells, "Where am I?"

The mosquitoes are so big up here that the little ones pester the big ones.

BLISTER RUST CAMP I

Hi! Hi! Hi! The Blister Rusters are at it again. They seem to be all pepped up for the coming season after many months of hard study in small crowded class rooms of the different colleges and universities of the Northwest.

Say! What can be grander than the wild wide-open spaces where one can pull all he wants to on Ribes and shout and sing to the Mountains on the other side of the draws, or hear an occasional grunt from one of the unfortunates who has lost his footing and starts rolling down the side of a steep ravine, or have delicious trout for breakfast, caught in the Little North Fork by a few of the talented fishermen in Camp I.

If you want to see a bit of real Western life, visit Camp I after the day's work of pulling those "gosh-darn" Ribes out. Their appetites are enormous and they all look forward to the wonderful "T-Bone steaks" that are awaiting them along with the other real "he-man" food which makes men what they want to be and their girls proud of it.

Who would be so foolish as to think a life like this miserable. "Not I," said the boy with the red hat.

SOUNDS ALL RIGHT!

Castles on hills! reminiscent of sunny France, the Rhine, and medieval history, but seldom seen in blister rust camps. However, this year there is a camp with a castle, and that is Camp One. A castle on the hill, too. Perched above the whispering waters of Picnic Creek, gently wafted by sweet smelling pine cones (that Riley might appreciate in his famous Wenatchee Applecover Ballad) and set high on the bluff embattlement of the frowning crag o'erhanging the camp.

A medieval setting could not be more complete. Securely guarded by the moat (Picnic Creek), the wall itself thrusts back all attempts at scaling. But once attained, the castle is a vantage point well worth attaining. Its scenery is unsurpassed.

From its easy portal, the members of Camp One are wont to spend leisurely hours, hours filled with content and fear of the coming descent to camp, hours necessary both physiologically and psychologically.

KNOWN EXTENT OF BLISTER RUST IN THE WESTERN UNITED STATES AT THE END OF 1927 FIELD SEASON

Western Washington.

Scouting in 1927 indicated that Ribes infection is generally prevalent west of the Cascades with a decrease in the amount of infection from the north toward the south and southwest.

Pine infection was located in 8 counties. Apparently there are two well-established centers of pine infection: (1) The general vicinity of Bremerton, Washington, on the Olympic peninsula, (2) Kendall-Maple Falls area in Whatcom County west of Mt. Baker and the Upper Skagit River to the east of Mt. Baker. It is quite conceivable that the widespread Ribes infection in western Washington came from these two centers of pine infection.

An important pine infection was located near Mt. St. Helens. This is a young infection. Cankers which have not reached the fruiting stage are numerous and in a year or two will be a source of aecia to establish infection in the Wind River region of Washington and in northern Oregon.

Oregon.

No pine infection was found in Oregon in 1927.* Ribes infection was located at 16 points in Clatsop, Columbia, Hood River and Multnomah counties of northwestern Oregon.

The locations of Ribes infections found in Oregon in 1927 indicate that the source of these infections lies in the general vicinity of Mt. St. Helens. The single center of pine infection found near Mt. St. Helens is not sufficiently large nor far enough advanced to have caused the Oregon infections. It is probable that there exists in that general region a well-established pine infection not yet located.

Inland Empire.

The known pine infection nearest to the Idaho white pine belt was located in the vicinity of Nelson, B. C., about 30 miles airline from the International Boundary.* Three separate pine infections exist in this vicinity. These are young and while they have not produced as yet a large volume of aecia, the volume is increasing yearly. Infection on *Ribes nigrum* was found for the first time east of Kootenay Lake in British Columbia, at three places, near Creston, B. C., Yahk, B. C., 5 miles airline north of the Idaho boundary, and Moyie, B. C., 20 miles north of Montana.

In eastern Washington Ribes infection was found at 10 points in four counties; namely, Stevens County, two places on *R. petiolare*; Ferry County, four places on *R. petiolare*, and one on *Grossularia inermis*; Okanogan County, one place on *R. petiolare* and one place on *R. petiolare*

and G. inermis; and Pend Oreille County one place on R. viscosissimum.

An Idaho infection was found at one point in Bonners County, 6½ miles north of Priest River and near a good white pine stand, on G. inermis.

No pine infection was found in 1927 in eastern Washington or Idaho.*

*In the spring of 1928 pine infection was located in eastern Washington and in northern Oregon. The infection in eastern Washington was located at the west side of Newman Lake. 8 infected pines with 21 fruiting cankers were found in an open swamp type growth closely associated with abundant G. inermis and R. lacustre. In Oregon, two infected trees with seven fruiting cankers were found on the north side of Larch Mountain in the vicinity of Multnomah Falls.

* * *

Chief Myers reports, "Reconnaissance in the Potlatch is well started and nothing can be said about it except that my crew is wondering why the trails go over the high spots rather than around.

"The timber here is almost pure white pine with Ribes a-plenty. I found R. petiolare almost up to the snow line; in fact, there is a clump of R. petiolare within 50 yards of our camp and snow within 10 feet of it.

"Nothing much happens except that a nocturnal 'porky' started to make a meal of Bonney's saxaphone case but was interrupted by Flack with an axe. Jazzmania has reached even the denizens of the tall and uncut."

CALIFORNIA ERADICATION

Dear Sir:

Send me all the information you have regarding the work of a blister rust remover. What other forms of employment are to be had around Angel's Camp?

A BLISTER RUST BATH

A nearby hotel offered to let the eradication boys take hot baths. One of the fellows went into the hotel after work, pick in hand, and told the clerk he would like to have a blister rust bath. The clerk said he didn't know what a blister rust bath was but the bath room was at

the end of the hall.

He took his pick and went into the bath room.

The clerk went to the manager and said, "You had better call the plumber. One of those blister chasers took a pick to the bath room in the place of wash cloth and soap".

* * *

Yesterday Lane planted his hob nails firmly on the back of a big timber rattler. Mr. Rattler objected strenuously and Lane didn't insist upon holding the position.

Last night hide No. 13 was stretched by the camp-fire to dry.

* * *

Messrs. Wyckoff and Root visited the eradication camp the last of June. When they left, Benedict accompanied them to Oakland to bring back a new Ford truck. Everyone is anxiously awaiting his return for at present every available means of transportation is broken down and soon the camp will be living on acorns, pine needles and fresh spring water. Later: Mr. Benedict returned with another old wreck stating that no new Fords were available. Wreck No. 3 will soon be reduced to uselessness.

Ye Camp editor

B enevolent
L oyal
I nspired
S ane
T eachable
E arnest
R easonable

R ational
U nited
S crupulous
T horough

C onsiderate
R eputable
E nergetic
E nthusiastic
D eliberate

EDITOR'S NOTE

The material for the first summer issue of the News Letter has been good. Several well written articles were not used because of their too local interest. Our work is so diversified and covers so much territory that a certain incident or a write-up of personalities may be of interest to only one camp or one project. Items should be of general interest. When pulling the wise-crack about the boy with the big appetite, you know "there's at least one in every camp."

If your article has not been used in this issue, just curse the Editor - and send in some more dope.

Make the next issue better.

GENERAL NOTES

Messrs. J. S. Welch, Commissioner of Agriculture for Idaho, and W. H. Wicks, Chief Horticultural Inspector for North Idaho visited our eradication camp No. 2 on June 25, accompanied by E. L. Joy of the Scouting Project. Having been, for some time, desirous of seeing our control work in the woods, they expressed great satisfaction with the trip.

* * *

Professor J. Nelson Spaeth, Research Professor of Forestry at Cornell University, completed his study of the relationship between pine foliage and canker development and left Vancouver, B. C. for the East on June 22. Say, Mr. East, if you have any more Profs. like Spaeth send them out. We like him.

* * *

A nasal operation was not enough for Bill Painter. When about ready to start field operations, he decided to go to the hospital for a mastoid operation. Bill is back in the office now and rarin' to get out on reconnaissance.

* * *

Dr. R. A. Kienholz, who spent last summer on western blister rust work was a visitor to the Spokane office on July 2.

* * *

All this talk of the re-eradicators about the swarms of black gnats is a lotta bunk. The Editor had lunch at Pete's camp on July 2 and I don't think that more than 2 dozen chunks were captured from his hide in the first ten minutes. So they're not so hot!

NOTICE TO PROJECT LEADERS AND CAMP BOSSES

Our supply of Circular No. 23 has been received from the Washington Office. Kindly let us know how many of your men would like a copy.

Vol. 3 August 15, 1928 No. 8

WESTERN BLISTER RUST

NEWS LETTER

* * *

Summer Issue No. 2

* * *

U. S. Department of Agriculture
Bureau of Plant Industry
Western Office of Blister Rust Control
Spokane, Washington

WESTERN BLISTER RUST CONTROL PROGRAM FOR 1928.

S. N. Wyckoff

The following is a brief account of the projects which the Western Branch of the Office of Blister Rust Control has under way for the field season of 1928, continued from the July issue, which dealt with the several phases of the Eradication work:

2. Cultivated Black Currant Eradication

The main job of cultivated black currant eradication for the present year is in California. Before this year approximately half of the state had been covered in the search for and the eradication of these plants. The work for the present season is being done in several of the coast counties south of and including San Francisco County.

There is also under way a survey of that portion of Washington lying west of the Cascades to determine the number of cultivated black currants now occurring in that region. Eradication was done there in 1922 and the present survey is to determine the rate and amount of re-growth and re-entry of the black currants during the past six years.

3. Ribes Ecology

Studies in Ribes ecology are again being carried on, in Idaho, Oregon and California. The purpose of these studies is to determine facts regarding the life history of Ribes which will be of value in securing the eradication of these plants. Studies are made of seed dissemination, seed germination, conditions favorable or unfavorable to seed germination and survival of seedlings, minimum age at which the bushes bear fruit, and the effect upon Ribes occurrence of several factors such as fire and logging.

The ecology work in Idaho is for the present year largely centered around Harvard, Idaho. There are, however, numerous areas in other localities in which studies had been previously set up where the work is being conducted.

The ecology work in Oregon is carried on in and near the Still Creek area, the scene of experimental Ribes eradication.

Studies in Ribes ecology were undertaken for the first time this year in California. The work is being confined to the Stanislaus National Forest. It largely consists of a study of Ribes conditions on logged areas of different ages. On the Stanislaus National Forest it is possible to find logged areas representing one to fifteen years since logging. It is hoped that a study of a large number of such areas will give some key to the relation of Ribes growth to logging.

4. Control Reconnaissance

Control reconnaissance is being carried on this year in Montana

Idaho and California. The work thus far conducted in Montana has been on the Cabinet National Forest. In Idaho reconnaissance work takes two forms; reconnaissance of National Forest land and cooperative reconnaissance of privately owned lands. Work of the first type, financed entirely by this Office, is being conducted on the Clearwater National Forest. It is hoped to finish this forest during the present summer. Cooperative reconnaissance, financed jointly by this Office and the several timber protective associations of North Idaho, is being conducted on the Clearwater, Potlatch and Coeur d'Alene timber protective associations. Reconnaissance in California is this year being done on the lands within the boundaries of the Plumas National Forest, some of which is in Federal and some in private ownership.

5. Scouting for White Pine Blister Rust

The discovery of a small focus of pine infection at Newman Lake, Washington, twenty-five miles northeast of Spokane, during the spring of 1928 has necessitated a thorough scouting of the Inland Empire white pine belt. It is logical to assume that if pine infection has become established at Newman Lake it also occurs at other points in this general region. The scouting work will consist of intensive examination of white pines and the most susceptible species of Ribes, where these two hosts occur in close association. The work is therefore two-fold in nature; first the favorable associations of hosts must be found, and second, the pines and Ribes in such associations very carefully inspected. This work is now under way in the extreme northern end of the Idaho panhandle and will progress in a southerly direction.

6. Investigative Work Upon the Life History and Epidemiology of the Rust

Highly specialized studies upon the nature and the behavior of the fungus which causes white pine blister rust are being carried on by the Office of Forest Pathology of the Bureau of Plant Industry. Because heavy and widespread infection of the rust is necessary for these studies they are mostly conducted in British Columbia where the rust has been present for a longer period than in Washington, Oregon or Idaho.

- - - - - -

And so the western blister rust control program moves on. Each year sees experiments of a more definite nature under way and each year brings the program nearer to its ultimate goal--the large scale application of local control to the white pine type and sugar pine type of the West. This year sees the first application of local control on a cooperative basis which has been undertaken in the West. The various experiments now under way are organized on such a scale that they could easily be placed upon the basis of large scale application operations. The two major factors which will determine the rate and scale upon which practical control measures can be undertaken are; 1- the development of suitable methods and 2- the development of a sufficient number of men both capable and familiar with these methods to supervise field operations.

BLISTER RUST FOUND ON RIBES

Blister rust was found on Ribes at two locations in the Inland Empire during the second week in August, one on the Kaniksu National Forest near Gleason Ranger Station, Sec. 6, T. 58 N. R. 4 W., the other on the Pend Oreille National Forest on Rattle Creek, Sec. 5, T. 57 N., R. 3 E.

The infection near Gleason Ranger Station was located on 2 bushes of G. inermis one hundred yards apart, ten leaves were infected on one bush and one leaf on the other. On Rattle Creek, infection was discovered on only a few leaves of R. laxiflorum.

Putnam and Joy spent the latter half of July on the Chelan, Colville and Wenatchee National Forests, locating suitable areas for a study of the infecting power of R. lacustre and R. viscosissimum, and scouting for the disease.

Infection was found on R. petiolare on the summit of the Kettle Range on the Colville National Forest. Pinus albicaulis 1¼ miles away was inspected but no infection was found.

On the Wenatchee National Forest light infection was found on G. watsoniana on 2 bushes of 400 examined. Associated pines were not infected.

Infection was also located on R. bracteosum at Scenic, 10 miles west of Stevens Pass, on the Snoqualmie National Forest. Here several bushes were infected. Ninety-five per cent of the leaves were infected on some. A careful inspection was made of pines nearby, but no blister rust is showing up, as yet.

CHEMICAL ERADICATION

Last year's work with hand sprayers at Bovill, Idaho, and with power sprayers at Clarkia, Idaho furnished sufficient information to warrant a large-scale application of chemical eradication during the present field season.

At Bovill, where the major unit of chemical eradication is located, power spraying, knapsack spraying and hand pulling were worked together. A total of 146.05 acres was eradicated; 72.12 by hand pulling, 73.93 acres by spraying. 14.10 acres were sprayed by power and 2,934 gallons of spray used or 208 gallons per acre. 59.83 acres were eradicated by knapsack spraying, absorbing 3628 gallons of spray or 61 gallons per acre. 5838 gallons of spray were used on the 73.93 acres sprayed by the two systems for an average of 89 gallons per acre.

The result of the spraying at Bovill is quite impressive.

One can walk down the road, which parallels the stream type, for a distance of a mile and a half and see a practically continuous strip of dead bushes. R. petiolare are turning up their toes. Good old chemicals! Power to you!

Experimental work in chemical eradication is being continued at Santa, Idaho where numerous plots have been laid out in previous years and various formulae tested out on different species of Ribes.

On Still Creek, Oregon in the Mt. Hood National Forest, areas have been staked out for experimental work on Ribes bracteosum, the wild stink currant of the coast region. Areas of R. bracteosum inspected early in August showed no signs of re-leafing and it is hoped that the results will be similar to those obtained on R. petiolare

SONG OF THE G. INERMIS

1. (Tenderly)
It's good to be out in the field again
Where the white pine lifts its head,
Where the wind blows sweet
And the stream runs neat,
And the inermis are never quite dead.

Cho. (All Male Voices)
I never grow old,
You can't knock me cold
With sizzles of spray down by back,
For my cuticle's tough
And my periderm's rough
With vascular bundles intact.

2. (With restraint)
I die in the fall but return in the spring,
To spread out my leaves in the sun.
And watch with a smile
That fatuous chile
Who thought that my race has been run.

3. (With passion)
The poison I've taken has sure packed a wollop
They have called upon all my reserve.
But I fear for the issue
Should they look at my tissue--
It's more than I really deserve.

4-20. Missing. The author regrets that verses 4-20 were destroyed in a recent brush fire.

ECOLOGY FIELD STUDIES

W. A. Rockie

The 1928 field studies in ecology consist chiefly of filled-in data sheets at the present time. The analysis of these data should yield some facts we wish to know.

Our 1927 controlled plot studies (11 in number) have 1928 Ribes seedlings on every area. Four of the eleven areas showed fall germination in 1927, but most of these seedlings failed to survive the winter season. These 1927 seedlings of fall germination did not become dormant with the advent of winter, thus explaining the high winter mortality. The surviving 1927 seedlings cannot be distinguished from 1928 spring seedlings since they were still in seedling condition this spring.

A very detailed and careful checking of all Ribes on these areas has been maintained during the present season. This should yield some valuable information regarding the mortality of these seedlings under the variety of conditions represented by our field studies. During 1928, five additional areas of controlled plots have been established. Practically all of our new work has been established near Harvard, Idaho and at the Priest River Experiment Station. By far the most important find this year appears to be the information regarding soil temperatures. Charred soils are approximately 50° F. warmer than an unburned area immediately adjoining. This is true only in direct sunshine, while the night temperatures are not greatly different.

Many other interesting temperature relations have been found, but cannot be enumerated.

Ribes fruits were very abundant in 1928, but very few of the fruits reach maturity. They were mostly eaten while they were still green in color, and far from ripe. Caged bushes which were protected from birds and rodents did not drop their fruits, and the unprotected green fruits did not drop on the ground. They disappeared - where? - we do not know.

Fruits of R. lacustre are apparently in less demand than those of R. viscosissimum for they still hang on the bushes in considerable numbers.

Observations are bringing us new ideas every few days, and time and continued efforts will gradually answer the puzzling features of the growth of Ribes.

First Ribes Hound - (Looking at a tub of clothes which has been boiling on the stove) - "That water isn't so dirty."
Second R. H. - "Oh No! I think it will pour out."
Third R. H. - "Don't let it get cold though."

Oregon Eradication.

CALIFORNIA ERADICATION

W. V. Benedict

During the month of July it has been apparent that the eradication types we have used for the past two seasons are not nearly so applicable in this locality. In an effort to develop eradication types more fully descriptive of working conditions, and with a possibility of a wider range of use, we have, at least tentatively, started to use the following eradication types, still retaining the old eradication types as timber types.

Before considering the new eradication type designations it is well to bear in mind the fact that the timber in this part of the Sierra Nevadas is mixed; mixed as to species and mixed as to age classes. In the following types sugar pine makes up 15% or better of the stand:

1. Mixed Mature

A mature stand of sugar pine types (irrespective of whether yellow pine or white fir or both are the principal associates) under which occurs an abundance of mixed reproduction, from seedlings to saplings and poles. Ribes are usually quite plentiful but are small and retarded in development. An extensive crew job.

2. Open Mature

A mature stand of sugar pine type, practically free of brush or reproduction. Principal ground cover either pine needles or bear clover. Ribes generally sparse and scattered. Some scattered reproduction but not enough to retard crew progress. A typical example is the open sugar pine-yellow pine stands on south slopes. An extensive scouting job.

3. Brush

An opening in the stand resulting from fire or logging, on which brush instead of reproduction is the principal ground cover. Frequently there still remains a scattering of mature trees. Ribes generally dense and working conditions difficult. Intensive crew work.

4. Stream

(No change in this type.)

Because of the topography in this particular locality, we get a mixture of sugar pine-white fir and yellow pine on the same slopes.

On such areas Ribes occur quite evenly over the entire slope. Ribes are usually thicker on sugar pine-white fir slopes than on sugar pine-yellow pine slopes, but it is the ground cover which affects most the cost of eradication.

During July 135,279 G. roezli were eradicated or 39.4 per acre and 2,985 R. nevadense or .7 per acre, making a total of 138,264 Ribes on 4,122.95 acres or 33.5 per acre.

To date 205,353 G. roezli and 11,314 R. nevadense have been eradicated, a total of 216,667 Ribes on 5,207.95 acres or 41.6 Ribes per acre.

Thirty-five rattlesnakes have been exterminated along with the 216,667 Ribes.

BLISTER RUSTERS AT PLAY

The "damage to pine" study plot on the north Fork of the Stilaquamish River on the Coast is reached by the Hartford and Eastern Railway on which passengers are carried by a gas car. While returning home from work one evening or rather, night, Putnam and MacLeod decided to chain the distance back to Barlow Pass Ranger Station where they were staying. Putnam, head chainman, would place a small stick on the track at the end of each 2 chains, as a marker for the rear chainman. This procedure continued for 2 miles, 26 chains. Consequently, a trail of sticks every 2 chains was left on the track for over $2\frac{1}{4}$ miles.

The next day the driver of the gas car picked them up at the plot to take them out to civilization. After a few conversational platitudes the driver remarked, "Those blankety blank kids down at this blankety blank camp stuck some blankety blank blank sticks on the blankety blank track every 25 feet up to Barlow Pass. I stopped once and took one of the blinkety blink things off the how-do-you-do track."

"Put" explained in his most suave and diplomatic manner that the "kids" were grown up, at least in years, and that they were just tiny twigs anyway. A good laugh was enjoyed by all, even the driver, and the air resumed its normal color.

* * *

One eradicator - (picking up a card of paper matches) - "Try one of these gopher matches."
Another ditto - "Whaddayamean, gopher matches?"
First one - "Light one--go fer another."

Oregon Eradication.

SUMMARY OF HAND ERADICATION IN IDAHO, JULY, 1928

Type	Camp 1		Camp 2		Big Creek Camp		Re-Eradication	
	Ribes	Acres	Ribes	Acres	Ribes	Acres	Ribes	Acres
Dense Mat.	3,470	22.4	262	.4	11,803	645.5	2	36
Open Mat.	17,860	17.1			33,713	737.25	311	283
Dense Pole	148	.75	16,681	357.35	2,384	216.0	318	271-7/8
Open Pole			2,426	147.35	51,287	524.25	4,473	268
Dense Repro.					2,715	28.0	194	103-3/8
Open Repro.	32,583	93.1			12,451	234.25	4	178
Cutover					5,607	29.0		
Stream	79,794	206.05	74,811	140.3	51,636	111.7	4,848	33¼
Swamp								
Sub-Alpine					94	410.0		
Total	133,855	339.4*	94,180	645.4*	171,690	2,935.95	10,150	1,173½

* Reports for camps 1 and 2 show only actual acreage covered by crews. At Camp 2 about 2,000 acres were eliminated by pre-eradication crew (checkers). Streams, draws and openings only were worked, the balance being classed as practically Ribes-free. Similarly at Camp 1 about 700 acres were scouted out.

Total Ribes, all camps - 409,875.
Total acreage, all camps - 7,794.25.
Average Ribes per acre - 52.6.

WONDER WHAT THE RIBES THINK OF IT!
(with apologies to--all concerned)

Draw the

Here come some of those ---- eradicators. Why can't they leave me alone?

Pictures

I've never done anything to them. They killed my father and mother and second cousin yesterday.

Yourself

Those fellows aren't very complimentary either. I wonder what they can have against our family.

I'm

I heard one of them say, "This one has no blister rust spots on it." I have spots on some of my leaves but he didn't look very carefully.

No

Ouch! That hurts! That fellow surely can pull. But I'll give him a run for his money.

Artist

I can't stand it any longer. I must give up. Well, he left my crown. I'll be back again next year.

EXPERIMENT IN STREAM AND REPRODUCTION AREAS

W. G. Guernsey

This experiment was carried on in the Picnic Creek area, situated in the Little North Fork of the Coeur d'Alene River drainage in the Coeur d'Alene National Forest.

The main object was to work the stream and reproduction areas with regular crew methods and carry on pre-eradication strip methods in the mature timbered areas.

This area being completed on July 16, 1928, gave some very interesting details. Many of the methods factors will be given at a later date.

It was found from a practical and administrative standpoint that the two, three, and four-man crews, with the foreman in line gave the greatest satisfaction in the area worked, and also checked a greater efficiency in live stem left per acre, the percentage of live stem pulled ranging from 94% to 99%.

On this area 111,376 Ribes were found with an average of 312 Ribes per acre, of the portion actually eradicated.

The side hills were worked by the checkers by strip system, these strips being ten chains apart, and running to the top of the main ridge. The data were then turned over to the camp supervisor and plotted on the control map of the area. Very few Ribes concentrations were found in the mature timber, which was therefore considered as Ribes-free for control purposes in this type. Over 300 acres of this type were scouted out; not worked but protected.

FORMATION USED IN RIBES ERADICATION APPLIED TO CONTROL OF GOAT GRASS

G. A. Root

The presence of goat grass, Aegilops triuncialis, a noxious weed detrimental to grazing interests, has caused much concern, and methods for its control have been devised. In San Joaquin County, the horticultural commissioner and twenty of his inspectors covered 1000 acres of infested grazing land in line formation and hand picked the stools of the weed. It took five days to cover the area and two grain sacks of the weed were picked and burned. The commissioner stated that it is undoubtedly the most expensive method of eradication or control, but believes it well worth the effort and expense and is confident that at least a 98% clean-up was effected this year. The cost per acre was about 84¢. The commissioner further stated that the owner of the property, very much pleased with the work, volunteered to pay the bill. Would that all pine owners were of the same trend of mind!

DASYSCYPHA FUSCO-SANGUINEA ON WHITE PINE

C. R. Stillinger

White pine blister rust will become more and more abundant in the Inland Empire as time elapses. It is important for all to be constantly on the lookout for it. In order to make accurate observations, some knowledge of the other pests of white pine which may be confused with white pine blister rust is desirable.

The object of this item is to call attention to one fungous disease which may be easily confused with blister rust, that is Dasyscypha fusco-sanguinea. This parasite is not a typical rust but belongs to that group of fungi which produce little cup-like fruiting bodies on the infected area. The spores of the fungus are produced in little sacs, a layer of which forms the inside of the cup. On a fresh specimen this little cup, which has a small stripe or stem, is light brown on the underside and a deep orange color on the inside. The colors are darker on older specimens. The edge of the cup inrolls when the specimen dies or has matured closing the cup so that the interior is not visible.

Distribution

I have been observing this parasite in the field since 1921 and have made several collections. Several collections have been given to me by some members of the Office of Blister Rust Control who were familiar with the disease. In general the collections which have been made indicate that the disease is generally distributed over the white pine area of the Inland Empire. As a rule the most heavily infected areas occur at relatively high elevations, that is 4500 to 6000 feet, on sites where the white pine is near its limits in altitude or is on a site rather unfavorable for white pine growth. However, it has been observed in some localities of fairly favorable white pine sites. At lower elevations it occurs only as an occasional limb infection.

Other Species of Dasyscypha

Several other species of Dasyscypha occur in this region, but they are chiefly saprophytes or very weak parasites. D. agassisii occurs on dead twigs of white pine as does D. calyciformis. The latter has also been collected on western larch and white fir. D. arida has been collected as a saprophyte on lodgepole pine, alpine fir, Engelmann spruce and white-barked pine.

Description of the Disease

The method of attack is apparently through the needles since the early initial spots of infection are found as shrunken,

circular areas around the fascicles of the needles. The bark shows distinct depressions for each year of growth of the fungus. Very often there is a distinct cracking of the bark at the end of the season's growth. Generally the fungus is not able to girdle trees over four inches in diameter.

The typical orange-yellow cups appear on the area that has been attacked the previous year. They may also appear on the several seasons of wood attacked if the part attacked has not died and the bark is not badly cracked. A swelling generally develops at the point of attack on the larger branches or trunk. Furthermore there is often an abundant exudation of pitch from the canker.

On parts of pine trees above four inches in diameter, the fungus is generally unable to girdle, but forms a deep seated canker. The fungus continues to grow in the canker and thus prevents the tree from healing over the canker. Often these cankers so weaken the tree on the side attacked, that the tree has bent over considerably. Furthermore, trees 10 to 30 inches in diameter have been observed with these deep seated basal cankers extending nearly to the heart of the tree.

Comparison with White Pine Blister Rust

The white pine blister rust canker produced on older trees is very distinct from the canker produced by *Dasyscypha fusco-sanguinea*. The old blister rust canker is characterized by broken, curled, cracked bark on the surface of the trunk of the tree. The canker of this Dasyscypha is a deep seated, distorted cavity, extending nearly to the center of the tree, the cavity appearing as a minute amphitheater. In both cases there is considerable development of resin in the wood and exudations of it from the cankers stream down the trunk of the tree. The typical aecia of blister rust will generally develop in the bark which has not yet been killed and the extension of the mycelium into the living bark produces a distinct brownish discoloration. The apothecia or cups of this Dasyscypha on the older cankers on the larger trees are very infrequent and occur on the edge of or slightly inside the canker.

There is much more similarity in the gross characters of the two as they occur on the younger trees. The incipient stages of the Dasyscypha infection produce a brownish shrunken condition of the bark. Blister rust causes an orange discoloration of the bark, generally accompanied with a slight swelling of the whole area. This is the stage where the greatest care must be exercised if the two are to be separated.

After one year's growth the two may be easily distinguished.

Each year's growth of the Dasyscypha is definitely indicated by a marginal ring either of broken bark or by a slightly raised area at the edge of the year's growth due to the fact that the bark at the edge has not shrunken as much as the inner part of the area. Further, the cups appear abundantly on the past season's growth. On the blister rust canker yellowish-brown pycnial spots will be found on the area where the fungus has been present for more than one year and soon after, the bark is broken by the aecia.

There may be an abundant flow of resin in both cases when the younger trees are attacked to such an extent that the differences mentioned may be somewhat obscured. However, by a careful examination of the infected area and a knowledge of the two diseases, no difficulty will be encountered in determining which fungus is present.

This is but a brief summary of my observations. I shall be glad to receive specimens of any of the Dasyscyphas which may come to anyone's attention. Careful watch should be kept for any Dasyscyphas parasitic on the western larch. This is important because the European Larch Canker, which is caused by a Dasyscypha, has recently been found in the eastern United States. Further, I made one such collection last summer in Montana which is believed by Dr. Perley Spaulding, of the Office of Forest Pathology to be the European Larch Canker. More collections of this nature will be invaluable.

NURSERY DOINGS AT HAUGAN

Savenac Baseball League is still going strong. The Hodogs are leading with 9 games won followed by Beavers 7 with Savenacs trailing with 2. The Savenacs rejuvenated team looks like a comer as they won the last game from Hodogs 15-8. It may have been due to the new ball donated by Tibbels, the crack short stop of the Savenacs and senior member of the H. A. Tibbels Mercantile Company of Haugan. Further interest in the league and our thanks are due to Ranger Haun who had one of his men swamp the out field. We expect the boys of the out field now to catch flies instead of pine trees and to furnish less acrobatic amusement.

Power pump went on a rest the other day, much to the sorrow and groans of the chemical shooters. The proud coats of tan sunburn were the source of much groans etc. etc.

Hand sprayers are working in the land (?) of the beavers. Their sudden dips sound much like the descent into the depths, of that animal himself. Many rescues from the dam depths have been made. Several are in line for medals.

One member of the hand sprayers was heard to remark, "I don't

see why the string line can't be laid beside the creek rather than on both sides."

The dance given in the dining hall was a decided success and deserves an encore. Several members were heard to remark that the next should be an "undress affair" or hard time dance. Boys' "overalls" are considered full dress.

Week ends of late have found groups in many kinds of amusement; bathing, fishing, huckleberrying and hiking. One ambitious group of five hit the trail to Thompson Falls 18 miles away. They say they reached there. Another reported a 5-lb. fish, but it never reached camp.

Babes Lost in Woods

Three members of our group, three weeks ago decided to visit Shorty, lookout at Gold Butte, some 9 miles up. A late return found them scampering along the trail at dusk. Some noise in the woods led them on the wrong trail and midnight found them at Hennesey, 5 miles east. At 1:30, willing to brave the dark no more, they routed out the telephone girl at Deborgia, 2 miles east, and getting Supt. Jones out of bed, implored that a machine come to return them up the Yellowstone Trail to camp. It speaks well for Jones that he still smiles when he meets them on Bunk Alley.

Breakey, chemical foreman, is carrying off the fussing championship of the camp--and then some. It took three bells the next morning after a trip to Deborgia to route him out of bed. Arriving with his sheepish grin, he was greeted by "Too many belles, Breakey."

"Dr." Lunsford was called home by the serious illness of his father.

We were pleased to entertain during the month, Mr. Wyckoff, Mr. Posey of the Washington D. C. office, Mr. Strong, Mr. Bell, Mr. Offord, Dr. Hubert and Mr. Andrews of the Pacific Marine Supply Co.

RECONNAISSANCE

The areas covered by reconnaissance are worked by the same standardized methods. Part of each area is worked intensively and part extensively. The intensive areas are typed and plot data on Ribes and timber are taken every ten chains (two one-tenth acre plots to a forty or thirty-two to a section) on a strip run through the center of each forty. Data on two one-tenth-acre plots are taken on each stream crossed. The areas for extensive work are typed only, no plot data being taken.

In Idaho 86 sections have been worked intensively and 683 extensively during July for a total of 769 sections.

The work has been divided on the different lands as follows:

	Intensive	Extensive	Total
Potlatch Timber Protective Ass'n.	16	34	50
Coeur d'Alene " " "	17	29	46
Clearwater " " "	21	48	69
Clearwater National Forest	32	572	604
Total	86	683	769

A great portion of the Clearwater National Forest consists of double burn (1910 and 1919) on which little or no reproduction is coming back. The greater part of this area is worked extensively, a few representative areas being chosen for intensive work.

In Montana 40 sections have been worked intensively and 6 sections extensively during July. This work is being done mainly on the Blackfeet National Forest.

On the Plumas National Forest in California, 56 sections have been reconnaissanced intensively and 26 sections extensively. The types which the crews have been working are mainly sugar pine-yellow pine mature, sugar pine-fir mixed and some cutover land. The main species of Ribes are R. nevadense, R. viscosissimum, G. roezli and G. inermis.

* * *

From Chief Myers reconnaissance camp comes the report, "We are working. Hence no poetry.!?*" However he doesn't say what thev are working. Here's the rest of the story;

"The weather's Hot - so hot that we are considering the purchase of paint brushes to use as butter spreaders.

"I wish to state that we will back our own particular brand of "no see 'ems" against Pete's or any other Blister Ruster's. None of us got much sleep until we hit upon the plan of using our ravenous trout who strike at the star reflections. We caught the trout, placed them in dish plans and set them by the bedside. It worked fine until the water leaked out of the pans and horse flies flew away with the trout.

"Speaking of the heat again, we thought to play a joke on Ritter by giving him a raw egg in place of a hard boiled one. Much to our surprise, the egg was thoroughly cooked by lunch time. Now you tell one.!"

(Editor) Go to it boys.! The first liar has no show in this neck of the woods.

RE-ERADICATION MEN EXPERIENCED MOVERS

Don Waldo

Due to the fact that the re-eradication project desires to check some in all three of the areas worked in 1926, they have had to move twice this summer already.

The last move was August 11 making the third time for setting up camp, counting the first one. The boys showed what experience would do this last time.

They got up at 6:30, ate breakfast, packed their pack sacks, rolled their blankets, tore out the old bunks, took down the tents, cleaned up the grounds and helped Payne pack the things in the truck ready to move. They arrived at their new camp site 10 miles distant at about 10 o'clock.

They then proceeded to set up camp; garbage holes were dug, frames for the cook shack and tables were built and the fly put over the frame. The stove was set up and some wood cut for it.

"Dad", the cook, then started a fire in the stove and began to get a dinner of roast pork, mashed potatoes, etc.

The boys built a wash stand, set up the boiler for heating water, and set up two tents in the meantime.

Dinner was served at 12 o'clock sharp, which I call fast work.

The first move was quite long and so rather than miss their dinner they set up the stove in the truck and "Dad" got dinner and served it like they do in those cook shacks that follow the threshing machines, while the truck was traveling at 35 or 40 miles per hour.

With their practice, the re-eradication men have about reached the height of efficiency.

LANTERN SLIDES SHOWN AT LOCAL CONTROL CAMP, CALIFORNIA

G. A. Root

The evening of July 28th, before most of the personnel of the camp, augmented by many campers, which constituted an audience of about 75 people, a series of slides of the blister rust were shown, supplemented by remarks by the writer and W. V. Benedict. The showing took place in the club room (a separate building) of the Dorrington Hotel, situated about a quarter of a mile from camp and the centre of social activities for that particular region. Ample light was given by a 300 watt globe, designed for a circuit of 28 to 32 voltage. A Delco lighting system at the hotel furnished the necessary current.

CAMP #2, IDAHO

Camp #2 was without the services of Aaron Glasgow, its camp boss, for about a week in the earlier part of August. Aaron had to leave to have some dentistry work done. We missed him but Ed. Stuart his assistant filled his place in a manner that pleased all.

If howling and yelling would take off the dirt like rubbing does then the boys of Camp #2 would be an extraordinarily clean bunch. For when they go into the creek at night after work there is always a mighty chorus of yells coming from the bathing place. The only reason we can give for this is the fact that the creek is getting pretty darn cold. Why not put a stove in the creek a little above the swimming hole fellows?

Herman Swanson, the methods boss, has left Camp #2 to go to Haugan, Montana. He won't be with us again this season and we certainly will miss him for when it comes to being a good fellow and mixer "Swanee" can't be beaten.

When Aaron Glasgow asks some of the boys to go picking huckleberries with him you can just be sure that there is something besides huckleberries in store for you. On Sunday the 12th a bunch of the boys went out with him. After picking about five gallons of berries he led us over the Burns Summit where we had the pleasure of meeting his folks and of enjoying one of the best meals we ever had. Everything from roast chicken to watermelon was on the menu. After this we will be willing to go picking huckleberries if we have to walk forty miles providing there is a treat in store for us like that at the end of the trail.

Can a "Blister Buster" get lost in these old woods around Camp #2. Well Lawrence Hankins has almost been convinced that a fellow can get lost without much trouble. The other day he wandered away from the crew and didn't return to it again. When the boys arrived in camp to organize a searching party he was already there. Of course not, he hadn't been lost; he just couldn't find his way back to the crew.

Louis Keyser, a member of our camp had to leave us being ill with diabetes. The boys miss him and we wish him a speedy recovery which we feel sure he will get for he has the old fight in him that is hard to down.

A Tragedy in One Act

He rowed her out on the smooth, shining bosom of the shining lake, and said in a voice choking with emotion, and quivering with excitement, "Will you kiss me?" "NO!" Came the response. So he paddled her back. (Curtain)

Camp One - Idaho.

ADAM'S ALE

G. A. Root

How many times in jest has the above been applied to that necessity of life, water? Yet underneath this frothy reference, millions look upon good water with an appreciation that almost approaches true reverence. Municipalities buy and even fight for good water. They sometimes go hundreds of miles to obtain it for their teeming thousands, knowing well that upon it depends their growth and prosperity.

The dweller in the country bores into the ground with the hope of getting good water, i.e. those who are not so fortunate as to reside near a good spring or creek. The transient camper throughout the nation's forest squats for the night before some sort of a water supply whether it be a well, spring or river. Upon the presence of water depends largely the location of camping sites.

This brings us down to our problem of sites for our blister rust camps, the solution of which is not so simple as it first may seem. This is particularly true in California. Much of the Sierra Nevada range, though cut by mountain streams and dotted here and there with mountain meadows with nearby springs, is relatively dry compared with the north Idaho country. Many of them go dry throughout a part of the summer season. The question of water pollution of those streams that do maintain a supply is to be considered. The accessibility of California's mountains offers a retreat for thousands who through the summer months roam the forests, using the available water supplies, some of which are difficult to keep from contamination. The bellowing herds of cattle and sheep have no purifying effect upon trickling streams, which otherwise might afford a satisfactory supply.

The present site of the local control camp, though not in the centre of the season's activity, was selected because of a good water supply. It is situated on the edge of a mountain meadow not many yards from a large spring, whose flow of water from granite "inners" is able to run an hydraulic ram. With this borrowed piece of machinery and accompanying pipe, water is conveyed to within several yards of the cook tent. Boy, some water! No ice is needed to make the finest lemonade you ever tasted. If in the stillness of the night you hear a gentle, periodic chug, let not thy slumber be disturbed! It is only this bit of mechanism faithfully doing its duty.

The overflow from this spring furnishes water for a small pond some distance away, in which the perspiring Ribes hounds disport themselves after a hard day's work. Good water tends for a happier and better camp.

ERADICATION BY OREGON CREW

K. Gray

Wind River Nursery, Washington

The work in that section consisted of taking out and hanging in the trees in a very artistic and draping manner all of the R. bracteosum plants we could find within the one mile zone. The streams were well covered and shady. Mosquitoes hunted in packs, but we seldom noticed them because of the prevalence of Devil's Club. Digging out Devil's Club stickers was fascinating and the boys were incessantly begging for "a five".

The work was almost entirely in stream type. In spite of the fact that it was reported that there were but few Ribes in that section, we found nearly 6000 plants of R. bracteosum with over 30,000 feet of live stem.

Still Creek, Mt. Hood National Forest, Oregon

The camp has again been established in this section. This year, we are beginning the task of cleaning out all of the area planted by the Forest Service. One crew is working in stream type while another is doing scout eradication. The scout crew has covered something over 200 acres. This work is being done with a crew of five men on stream type and two as a scout crew. Few figures may be given: In the six days which we spent here in July, 1217 Ribes with 32,361 feet of live stem were pulled. There is a big job ahead of us here.

* * *

First Ribes Jerker - After looking thru a deserted cabin: "I didn't see any springs in there."

Second ditto - "Oh, they are above the camp, thats where the water comes from."

An extract taken from a letter of a blister buster to his beloved: "We have a beautiful black dog in our camp, he belongs to the cook with a black tail."

Methods Man - (After looking at a half finished trout on his plate) "I don't want to eat that fishes head."

Checker - (As he reached for another crisp one) "Go on, thats good brain food."

Methods Man - "Think I want a fishes brains?"

Checker - "Well you'd be ahead wouldn't you?"

Nota Bene

The attention of field men who submit expense accounts is hereby directed to Mr. Calhoun's recent "Memorandum to Field Men regarding preparation of expense accounts." It is in your own interest to apply the advice contained therein. The expense accounts of most temporary men and some permanent men would be paid sooner if more complete information were given with some items.

GENERAL NOTES

Mr. G. B. Posey, Senior Pathologist, arrived recently from the Washington Office. He will spend several months looking over the western blister rust work.

* * *

L. N. Goodding, Oregon State Leader, was taken suddenly ill early in August. An operation for sinus trouble was necessary. Goodding gets into the field for short trips but is still under the doctor's care. We wish him a speedy and complete recovery.

* * *

R. H. Weidman, Director of the Priest River Experiment Station, is spending several weeks in the Blister Rust Office on report work.

* * *

Elmer Henry, Bovill Chemical Eradication Camp 2, arrived in Spokane last week with his legs and hands burned. Chemicals on his trousers became dry and ignited through friction. He is now at his home in Spokane and getting along O.K. according to latest reports.

* * *

C. R. Stillinger has been transferred from the Office of Blister Rust Control to a new service or bureau in the Department to be known as the Plant Quarantine and Control Administration, which will now administer the blister rust quarantine work. Roy is in the Domestic Plant Quarantine Division with headquarters at 406 Federal Building, Spokane.

Vol. 3 September 15, 1928 No. 9

BLISTER RUST NEWS LETTER

for

STATE AND PROJECT LEADERS

* * *

Confidential

* * *

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U. S. Department of Agriculture
Western Office of Blister Rust Control
Spokane, Washington

BLISTER RUST A BAD ACTOR IN 1928

Scouting for blister rust was confined to the northern portion of the Idaho white pine belt on the Kaniksu and Pend Oreille National Forests until the discovery of the rust at Bovill on August 18. The crews were then transferred to Pierce and Elk River to scout in the southern portion of the Idaho white pine belt.

The following table gives the infection points located to date:

Region	County	No. of Infection Points	Species Infected	% Leaves Infected
Ione, Wash. 6 miles east	Pend Oreille	1	R. viscosissimum	1
Gleason Ranger Station Kaniksu National Forest	Bonner	3	G. inermis	1
Rattle Creek, 24 miles North of Clarks Fork, Pend Oreille National Forest	Bonner	1	R. laxiflorum	3 leaves
Near Clarkia, Idaho	Shoshone	2	R. petiolare	1-25
Gold Center, Ida. for 7 mi. along upper St. Maries River.	Shoshone	1	R. petiolare	25
East Fork Potlatch Creek at Chemical erad. camp	Clearwater	1	R. petiolare	3
Collins, Ida. W. Fork Potlatch Creek	Latah	1	G. inermis	1 leaf
Elk River, Ida., Elk Creek and tributaries	Clearwater	6	R. petiolare	1-90
			R. lacustre (near infected R. petiolare)	2
Pierce, Idaho	Clearwater	5	R. petiolare	1-90
Near Oxford Ranger Station Clearwater Nat. For.	Clearwater	2	R. petiolare	35-50
Headquarters, Clearwater Timber Company	Clearwater	4	R. petiolare	1-10
Headquarters, C.T.P.A.	Clearwater	2	R. petiolare	4-90

SPECULATIONS

H.N. Putnam

Let us speculate.

The North Fork of Reed Creek, on which the Clearwater Timber Company Headquarters are situated has been scouted. Four separate R. petiolare infections were found, none closer than 3/4 mile to any other. R. petiolare occurs in abundance all along the creek. In many places, particularly in

beaver swamps, R. petiolare is found in stream type two chains wide. It is estimated that the scouts inspected 5% of the bushes. Since four infections were found, it is reasonable to believe that 80 separate infections on R. petiolare exist on the North Fork of Reed Creek.

Let us look at it another way.

A conscientious approximation of bushes examined was 4100. Assume that each bush occupies 4 square feet, as good an assumption as any other until a better one comes along. The area of bushes examined, then occupies 16,400 square feet, nearly 1/4 of an acre. Assume that each of the four infections found resulted from one aecial hit. We have, then by a slight arithmetical effort, 16 aeciospores falling on an acre of ground. The aecial source is an unknown distance away, and the influence of local wind currents is not considered.

It is estimated that there are 45 acres of R. petiolare Class E stream type. Possibly 15% of this area, or 6.75 acres are occupied by R. petiolare bushes. If 16 aeciospores fell on an acre of R. petiolare bushes, and took root, there would be 108 separate infections in the North Fork of Reed Creek.

The chief value of these idle speculations is to impress upon us more strongly the fact that there is always much more blister rust present in a region than scouting results would indicate.

SUMMARY OF HAND ERADICATION, IDAHO, AUGUST 1928

Type	Camp 1		Camp 2		Big Creek		Re-eradication	
	Ribes	Acres	Ribes	Acres	Ribes	Acres	Ribes	Acres
Dense Mature	3,288	6.6	2,196	108.0	10,881	513.5		
Open Mature	44,526	73.6	32,780	342.75	59,581	604.5	230	101.0
Dense Pole	1,405	1.6	4,676	175.2			65	61.0
Open Pole			41,305	864.05			5,280	1,000.5
Dense Repro.			23,975	291.9	160	133.25	22	56.0
Open Repro.	20,990	77.9	34,695	70.0			783	8.0
Open Pole CO.					167,888	929.25		
Stream	128,641	153.4			23,705	89.0	2,265	10.5
Swamp								
Scouted out		400.0		300.0				
August	198,850	713.1	139,627	1,851.9	262,215	2,269.5	8,645	1,237.0
June	41,196	1.500.0	40,078	74.5*	91,474	509.15	4,862	139.0
July	133,855	1,039.4	94,180	2,645.4	171,690	2,935.95	10,150	1,173.5
Total to Date	373,901	3,252.5	273,885	4,571.8	525,379	5,714.6	23,657	2,549.5

*Area scouted out not reported.

A TASTE OF CHEMICAL ERADICATION

B. A. Anderson

I've been aching for a month to get this off my chest and a crack at the chemical outfits located in the vicinity of Bovill, Idaho. About the first of the month, Phil Simcoe, Aaron Glasgow and myself received orders to report at Bovill for a little intensive instruction in the application of chemicals to our common friend, R. petiolare. One Barney Ganoung--may the Lord in his mercy preserve his hide--met us at Spokane.

The first day at camp we were invited to look around. That day we took sweet revenge for the miseries we endured later. We found the rounders were nursing blister rust in their swimming hole. It was the only peaceful day we spent. You could tell by the way the weaker sisters of the rabble acted that the visits of camp bosses, project leaders, and such low white trash was old stuff to them.

The second day somebody hauled out three old gasoline barrels with a long hose and pump attachment, filled them to the top, two men hoisted them on our backs, and started us between two string lines. The area was especially reserved for the visits of camp bosses. Every time you ducked to get under a bush a young Niagara of chemical would gurgle cheerfully down your spinal column to flow finally into your boots.

But that wasn't the worst part of it--they stagged our pants three inches above the knees for some reason or other. One thought of worming thru devils clubs, bull thistles, and spiked hawthorne in that minus attire made you feel as naked as the lady who did the "Dance of the Seven Veils" with six of them in the wash. And after the day's work was over, they threw us in the creek "So that we wouldn't catch fire on the way home".

After that they let us come in for supper and rub our aching muscles and rheumatic joints. All through the night I listened to Phil groan and shed tears of futile rage. They say Aaron comes from a respectable family but I'm ready to wager my summer's mazuma that he never picked up the vocabulary I heard him use that evening around the family hearthstone. As for myself, I vainly sought the soothing arms of Morpheus.

All that Phil, Aaron and I are praying for is to catch Ganoung, Joe Moore, and Percy Bell in an eradication camp. Caesar had his Brutus!--

---

First Ribe Puller: Do you like coffee, Bill?
Second R. P.: Certainly I do.
First R. P.: Well, you made such a noise swallowing it, I thought perhaps it hurt you. Does it?

Camp 2, Idaho

CALIFORNIA ERADICATION - AUGUST, 1928

Eradication work during August was almost wholly scout work as activities were centered in more or less open sugar pine-yellow pine timber. Ribes were sparse and scattered being practically restricted to streams, draws and rock outcroppings.

44,555 G. roezli and 4,019 R. nevadense, a total of 48,574 Ribes were eradicated from 3,147.7 acres or 15.4 Ribes per acre. This brings the season's total to 265,241 Ribes from a protected area of 8,355.65 acres for a season's average of 31.7 Ribes per acre.

CURRANT BUSH SUPPORTED ON HIGH

G. A. Root

The following is taken from the August issue of Yosemite Nature Notes in a discussion of the Grizzly Giant, the largest tree in the Mariposa grove of giant redwoods. In a paragraph describing the lack of offspring from this great tree, the article says:

"With a spirit unbroken throughout centuries of torture, this old tree refuses to be discouraged, as witnessed by its attempt to nurse to maturity a young shrub of a foreign species, which may be seen growing vigorously on the top of one of the huge limbs extending from the Grizzly Giant's trunk.

"Sufficient litter to stimulate plant growth has accumulated on top and toward the end of this forked limb about eighty feet above the earth. There may be found, smiling in the morning sunlight or silhouetted by shade of midday, the light green leaves of a wild currant bush. How greatly it contrasts with the heavy foliage of its grand old host."

Note: The person who discovered this bush and identified it as a member of the currant family, most assuredly deserves a job in a scout crew.

For W. A. Rockie. During the past summer the crews have found two instances of the layering of R. viscosissimum. The bushes were at an elevation of about five thousand feet and in open mature white pine.

"Is it true you hit John twice, and knocked him down?"
"Yes, sir, it is."
"Don't you know this is wrong? Why did you do it?"
"Well, he asked me, 'if a hen and a half laid an egg and a half in a day and a half, how many---'"
"Is it true you ONLY hit him twice?"

Camp 2, Idaho

THE SUMMER'S WORK

Now that the summer's work is over and the men are returning to various schools or to the office, we hear strange tales of how the summer was spent. Some of the fellows admit they didn't do anything worth while and others claim to have slaved; like the wretches which they are, still others seem to have had a nice vacation. Why not all stick to the same story? Try something like this and see how big you get by in any crowd. (Be sure you are in a crowd before telling it--better chances for getting a good watch).

I had a glorious summer in northern Idaho (or make it Alaska). Way back in the wilds where there is plenty of game, and talk about good fishing, Boy!!! I practically lived on trout, venison and grouse all summer. We were so far back in the hills that there wasn't a chance of getting anything fresh from stores. Seventy-five miles from the nearest railroad and 30 miles from the post office. Since it meant a sixty-mile hike for mail, we only got it once a month. Thirty long miles each way, and when I say long miles I mean long. I think it was measured as the fly crows, I mean the crow flies, 'cause it took 10½ hours of good steady walking to cover those thirty miles. I know we averaged more than three miles an hour.

No, the ranger never said anything to us about killing deer and birds out of season. He even ate several meals with us. As long as we only killed for our own needs, it was perfectly all right with him. We had to have meat and there was no place where we could buy it.

We had a lot of trouble for a while with bears coming into camp and robbing the larder. I sat up one night and hid high up in a big pine tree watching for them. About 12:30 a.m. I heard the brush cracking and about a half a minute later I saw two big brown fellows come into the clearing. There was a big full moon so I had plenty of light. Boy, when I saw the size of those babies I didn't know whether to trust my 30-30 or not. About that time I wished I had a French 75 but when they were about 20 yards from me I let them have it--Bang! Bang! I dropped both of them. I sure was some excited, the sweat was just pouring from me. That's sure the wildest country I've ever been in--ninety-five miles from the nearest railroad. If I had my say about it and dad'll let me, I'm going to be right back up there next summer. What's that? You say, "didn't I have to do any work?" Oh, why bring that up?

Note: This story to be told only on a davenport in front of a fireplace in any fraternity house.

An anonymous yarn - by Peterson

"It takes a lot of pull to hold this job." said one Ribe-jerker to another.

DASYSCYPHA FUSCO-SANGUINEA CAUSES DAMAGE

A large stand of white pine on the divide between the North and South Forks of Big Creek is suffering serious damage from an attack of Dasyscypha fusco-sanguinea. While as a general rule an attack of this disease seldom progresses beyond the endemic stage, it is safe to say in this case that the disease has reached epidemic proportions. The area is located at an elevation of about four thousand feet and covers one hundred or more acres.

The stand is about 20 or 25 years old. Practically every tree has been ruined by large cankers on the trunk or leader. The upper part of the stand is a mixture of P. albicaulis and P. monticola. Both species are affected although the former seems to be more resistant in this locality.

Goodding reports "Scouting trips were taken to many different points in the Siskiyou Mountains and the mountains east of Ashland. Throughout this region white and sugar pines are limited and very scattering. In the mountains east of Ashland sugar pine are practically nil and western white pine are very scattering at the heads of the streams. In the Siskiyous the sugar pines come well down toward the bases of the slopes but are, for the most part, inferior and scattering. At higher altitudes a belt of fairly good sugar pine occurs running ten or fifteen per cent of the stand. In no place in the Siskiyous which I or others of the crew visited this season can sugar pine be spoken of as abundant.

"The Ribes of this region are interesting because of the transition from the species we may think of as Oregon species to those we may think of as California species. R. sanguineum seems to be almost entirely replaced by R. nevadense, and R. viscosissimum by R. hallii, if we admit the existence of such a species. The Siskiyous are the only mountains in which we have found G. marshallii. R. lacustre is abundant and lusty along many streams. Both G. cruenta and G. lobbii range from low altitude to about 5000 feet. On some burns G. lobbii is extremely abundant. Above an altitude of 3000 feet G. binominata is quite abundant. G. marshallii occurs in both the timber and in the open and is quite abundant in places."

The timber-geared editor of the Blister Rust News spent a few days at the Big Creek camp in September.

"Yes, sir! This is the first blister rust camp I've visited this summer that I've heard so many good stories," remarked the editor after we had cleaned up a few of our stock for him and drawn on Mr. Bedwell's. However we'll wager it's not the first group he entertained after dinner.

T. P. A. OFFICIAL VISITS ERADICATION CAMP

An interesting and interested visitor to the Big Creek camp last week was Mr. J. S. Barron, Secretary of the Priest Lake Timber Protective Association.

Accompanied by Anderson and Bedwell, he went over some of the areas eradicated by the crews, and for the purpose of comparison, adjacent areas which had not been eradicated were covered. Mr. Barron was much interested in the work and very favorably impressed by the results.

Page Mr. Rockie! Brand new R. viscosissimum bushes to the tune of several thousand per acre were found on some of the brush pile burns on the eradicated area. Some of these bushes had reached a height of almost two feet.

Did you hear that one about the Scotchman who insisted on getting married in his chicken yard so that when the neighbors threw rice---?

How about that for an idea, Bill Guernsey and Frank Patty?

Big Creek.

NOTES

During the past week several of the camps have completed their season's work and the men are wending their way back to studies and winter sports.

* * *

During the month of August the camp bosses of the various hand eradication camps spent several days at Bovill to become familiar with the chemical eradication project in all its workings. Lurid details are given elsewhere in this issue in the true Andersonian style.

* * *

Benedict arrived back from California on September 14 to hibernate in the Spokane office.

* * *

Pre-eradication work will be commenced on the Clearwater National Forest in the near future.

* * *

Geil, Myers, Painter, Peterson and Whiting have arrived in the Spokane office after a summer's work well done.

Vol. 3 October 15, 1928 No. 10

WESTERN BLISTER RUST

NEWS LETTER

* * *
Confidential
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U.S. Department of Agriculture
Bureau of Plant Industry
Western Office of Blister Rust Control
Spokane, Washington

STATUS OF WESTERN BLISTER RUST CONTROL WORK

S. N. Wyckoff

Distribution of the Rust.

During the 1928 season blister rust was found to be generally spread over the white pine belt of northern Idaho and to a lesser extent over northwestern Montana. The infections found were all on Ribes, those in the southern part of the white pine belt being largely confined to *Ribes petiolare*. In Oregon a new focus of pine infection was found on the west slope of Mount Hood. Numerous infections on Ribes, largely on *R. bracteosum*, were found in the northern Cascades of Oregon and in the Coast region in Tillamook, Polk, Benton and Lincoln counties. It can thus be said that the rust has spread over the entire belt of merchantable western white pine in the Inland Empire and half of the distance from the northern to the southern boundary of Oregon.

Effect on Our Work

The result is that a large scale control program must at once be instituted in the Inland Empire white pine belt. In addition to providing leadership for such a control program, this Office must continue its experimental program. These are the two principal duties which now devolve upon this office.

The General Control Program

In December, 1927, this office made general recommendations to its cooperators regarding the form which we believe a control program in the Inland Empire should take. We have recommended that the control program should consist of (1) general stream type eradication, and (2) eradication in pole and reproduction stands and the maintenance of the proper Ribes free condition in the stream type. This program is based upon the fact that the most highly susceptible native Ribes occur in very dense concentrations in the stream type and nowhere else. The highest degree of protection can be secured by first removing these dense concentrations of highly susceptible Ribes which occur along the streams. When this immediate danger is removed it will then be time to undertake the protection of young timber stands in which there may occur considerable numbers of other Ribes.

It is not to be considered that all of the stream type eradication will necessarily be completed before the second part of the program is undertaken. The first effort will be made on stream type. But if the rust becomes established in various localities it may be necessary to perform eradication in pole and reproduction stands before the stream type work is completed. The time relation between the two parts of the program must necessarily be based upon the rate of spread and intensification of the rust.

The time necessary for completion of stream type eradication in

the Inland Empire is entirely dependent upon the rate at which funds are made available for this purpose. It is, however, considered highly desirable that the job be completed in not more than 10 years. A very rapid spread and intensification of the rust may make it necessary to finish this work within a shorter period. The follow-up and maintenance work in the stream type constitutes a permanent operation. It is hoped, and in fact expected, that it will gradually become an integral part of the forest protection program. The recommended policy is that this work should be undertaken as the rust shows signs of becoming established in any locality. The rate of intensification of the rust will not be uniform over the entire region involved. It is to be expected that a condition will arise similar to that which now exists in New England. Certain areas, for reasons not readily apparent, will for many years remain free of the rust while in other localities the rust will intensify very rapidly. Elasticity in the program will take advantage of this situation. We recognize the fact that well stocked pole and reproduction stands are ridding themselves of Ribes by natural means. In those localities where the rust will permit such action we desire to take advantage of this natural process, and to concentrate the work in places where damage will be more rapid.

It is the recommendation of this Office to its cooperators that to secure the best results and to prevent rapid damage the stream type eradication program be put into effect at once. The Forest Service has accepted this recommendation, and is planning such a control program for the next fiscal year. It is expected that during the fiscal year 1930, approximately $100,000 will be expended by the Forest Service upon stream type eradication. In accordance with the recommendations of this Office the work will first be undertaken on the Clearwater National Forest, in the Musselshell Ranger District. Our recommendation in this regard is based upon the large amount of infection found this season on R. petiolare in the southern part of the white pine belt. Because of the presence of R. petiolare in these localities the immediate danger seems to be greater there than in the north. While the funds for this work will be appropriated to and expended by the Forest Service, it is planned that this Office shall give every possible degree of technical advice, assistance and cooperation, in the way best designed to give the Forest Service the benefit of our experience in such work.

No definite plans have as yet been announced by the State of Idaho or the private lumbering interests of this region in regard to local control on their lands. This will doubtless be the subject of discussion at the annual conferences and other meetings during the coming winter.

It is the urgent recommendation of this Office that in undertaking a program of stream type eradication the several agencies concerned concert their efforts so as to amalgamate the program into a single operation. We appreciate, and are pointing out to our cooperators, that one important factor in the success of such a program is that the work

should be properly unified. The ideal condition is that stream type eradication should be undertaken simultaneously by all agencies concerned, and that all lands needing protection should be worked over in an orderly fashion irrespective of ownership. This is an important point and one which will have great bearing upon the success of the work.

Continuance of the Experimental Program

This office has, since 1922, been experimenting upon local control. We feel that we are now in a position to recommend a plan of campaign and working methods. We appreciate the fact, however, that our experimental work is not finished. Further experimentation will decrease our costs to lower levels. This applies to both hand pulling and chemical eradication. It is also necessary for us to thoroughly investigate the possibilities of keeping Ribes growth to a minimum by means of forest management and silviculture. This investigation will center about the results of Ribes ecology work and experimental eradication. A third, and very important step, is that we must at all times scout for the disease, have knowledge of and watch its rate of spread and intensification and determine by plot studies the rate of damage to white pine. As part of this work it will also be necessary to determine the exact degree of protection given to an area by our standardized methods of Ribes eradication. Much of this work is being done by the Office of Forest Pathology under the supervision of Mr. Lachmund. But it will devolve upon this office to watch the rate of spread of the rust over the western white and sugar pine belts of this country, to ascertain the rate of damage to pine under the natural conditions which exist in these regions, and to determine the effectiveness of our Ribes eradication work in terms of pine protection.

The above remarks in regard to protection and experimental work pertain to the Inland Empire white pine belt because the rust is now present there. A similar process of development must necessarily be gone through in the sugar pine belt. Work will there remain upon an experimental basis until such time as the rust is found. It is the plan of this office to steadily increase the scope of the experimental program in the sugar pine belt in order to have a plan and methods for control, and to develop a personnel familiar with the region and work who will be able to supervise the control program when necessary.

PRE-ERADICATION ON THE CLEARWATER

Anderson and Guernsey

The Musselshell district of the Clearwater National Forest has been chosen by the Forest Service for their initial work in the control of blister rust in the West for the fiscal year 1930.

In the period September 18-29, the following men from the Spokane Office of Blister Rust Control assisted Mr. T. Breen of the U. S. Forest Service in the pre-eradication of the area: W. V. Benedict, M. C. Riley,

P. S. Simcoe, B. A. Anderson and W. G. Guernsey with C. C. Strong in charge.

The work consisted of the determination and mapping of the eradication classes of stream type, location of camp sites with reference to availability of trails for packing supplies, Ribes concentrations, and a general survey of the area.

The results show that 4 to 5% of the area, or approximately 3500 acres, is stream type and will have to be eradicated to adequately protect the area from blister rust.

This month we unanimously nominate Mr. M. C. Riley for admittance to the Home of Broken and Decrepit Foresters. Mr. Riley won his fame not at the throttle, but at the Shoo-Shoo end of what is known in a packer's parlance as a "Hard tail". During the sojourn in the Clearwater, Riley packed into Eldorado meadows for several days stay.

On the night of September 26, Mr. Riley swears that he tied one foot of his pack anumal behind his or its back and anchored it to a three ton boulder. Much as we believe in Mr. Riley's veracity, said animal appeared at the Musselshell Ranger Station, A. W. O. L. after walking nine miles up hill with the afore-mentioned encumbrance.

COBWEBS

California advertises her climate
And boasts of her bright sunshine,
But a distinguishing feature not mentioned
Is the cobwebs between the pines.

There are cobwebs in intricate patterns,
Cobwebs in long straight lengths,
And cobwebs woven in masses
That possess remarkable strength.

No doubt to northern Ribee hounds,
Who seem to know a lot,
This story may sound stringy
But really it is not.

We use the large webs for tent ropes,
The smaller ones replace twine,
The knotty ones serve as fire-wood
And the rest for fishing line.

Now we are working on a problem,
When we solve it 'twill be fine,
For then the lowly spider,
Will run our boundary lines.

D. R. Miller

EXPERIMENTAL WORK IN CHEMICAL ERADICATION AT BOVILL, IDAHO

H. E. Swanson

During the last twenty days of the field season, ending September 28, on Potlatch Creek at Bovill, Idaho, the work was largely directed toward experimentation and method studies in chemical eradication. An effort was made to perfect a practical method for both power and knapsack spraying, adaptable to all conditions, which would reduce the cost of chemical eradication to a minimum and also, with these methods of working developed, to get a direct comparison between power spraying, knapsack spraying, and hand pulling in Ribes concentrations from 1% to 35% and over, to determine which method was most practical in each type of concentration.

For about ten or twelve days at the beginning of this experimental program, the project was fortunate in having the advice and assistance of Mr. P. R. Andrews of the Pacific Marine Supply Company, Seattle, Washington. His thoro knowledge and understanding of equipment was very helpful in the development of the power unit. On the 12th of September, six men from the chemical eradication project at Haugan, Montana, arrived in camp, to provide sufficient man power to carry on the experimental work. Members of the permanent personnel of the office also joined the ranks to assist in the work and to become acquainted with chemical eradication.

During the course of operations a total of about seventy acres of stream type was covered, in Ribes concentrations from 1% to 100% (a 100% concentration was secured by taking an area with 100% brush density and spraying all the brush as well as the ground). Except on the 100% area; the work was performed at a much lower cost by knapsack spraying than by either power spraying or hand pulling. This includes comparisons made on Ribes concentration classes, from 1% to 25%. For the sake of direct and accurate comparisons, the same areas were often worked by all these methods, the hand pulling being performed last. The method used for the knapsack work is an individual block system. In general, it consists of a four or five man unit, one of the men supervising the work, mixing chemical, laying out string line, and establishing filling stations for the other three or four men. The latter, equipped with knapsack sprayers, are each assigned to individual blocks, about .3 to .5 acres in size and including an entire section of the stream type, which blocks are divided by string into strips 16 feet to 20 feet in width. This method succeeded in eliminating about all the lost motion occasioned by crew work and replacing it with an individual responsibility and a competitive feature which is conducive to faster and better work. During the last week of the field season, an individual block system, using twelve nozzles from one motor, was developed for the power unit. Time did not permit a thorough trial of this method, but it is probable that it may prove more practical than knapsacks in some of the heavier concentrations.

Some additional experiments and tests were made with an air compression knapsack sprayer, furnished by Mr. Andrews. This power tank

made a 20% saving on the use of solution, an important factor in the reduction of chemical eradication costs. Further experimentation in all phases of chemical eradication methods will be necessary, but at the close of this season, a practical and efficient method of chemical eradication by the use of knapsack sprayers has been developed, with cost data to show its relation to the cost of power spraying and hand pulling in various Ribes concentration classes.

BLOCK 10, CALIFORNIA ERADICATION

Our queerest block is number ten,
Its general shape is a wedge,
But the oddest thing about it is -
The darned thing stands on edge.

To give a good description
Is more than I can do,
But I'll exert an honest effort
In describing it for you.

When viewed from a distant hill-side
There seems to be many trees,
But when the crew men get there
All they find is big Ribees.

On a chilly Monday morning,
Four crews started the block
And every bush encountered,
Was wedged in solid rock.

They chiseled and they sculptured,
From early morn 'til night
But their work seemed worse than useless,
'Twas a hard and losing fight.

After six weeks of prison labor,
Which started with a rush,
They stopped to take a check - and lo!
They had pruned one Ribee bush.

D. R. Miller.

RIBES VISCOSISSIMUM

W. A. Rockie

About 4 miles north of Harvard, Idaho, some logging was carried on during the years of 1924-25-26.

On a portion of what is known as the Stark cutting area, there has resulted a stand of Ribes viscosissimum such as has not been reported

by any member of the Blister Rust Office.

These Ribes now stand about 3 feet above the ground with a Ribes density that is more nearly complete than on any other slopeland area on record at Spokane. These fruiting bushes of R. viscosissimum average 9400 per acre, with an average live stem of about 10 feet per bush.

The stand is practically unmixed with any other vegetation, with the result that here exists the perfect R. viscosissimum stand.

It extends over an area of several acres.

FACTS AND FANCY

L. N. Goodding

Ribes bracteosum and R. nigrum are not the only Ribes in Oregon that will take blister rust. It was twice collected in the wide, open spaces far from pines on Grossularia divaricata. It was collected near infected pine on R. lacustre and many miles from known infection, on Ribes petiolare. A casual examination of the last mentioned infection seemed to indicate that the R. petiolare does not take so kindly to the disease as does R. bracteosum. The spots on the leaves were for the most part small and widely scattered, but the production of telia per unit area was heavy. Within a half mile six different clumps of bushes were found infected. This last may indicate that pine infection already fruiting is much closer than any of which we have definite knowledge.

On a recent trip to eastern Oregon, sugar pine was noted on the Metolius River due east of Mt. Jefferson. At this point trees are rather abundant, and some are of large size. This is twenty miles or more north of its range east of the Cascade Mountains as reported in Sudworth's "Forest Trees of the Pacific Slope". Investigation may reveal it still much farther to the north on that slope.

A few years ago the prophets talked about the time when blister rust would be in Idaho and Oregon. They reasoned that the spread would be mostly to the north as winds and climate generally are most favorable for spread in that direction. It was suggested that the dry Inland Empire region might prevent the eastward spread for many years. In fact blister rust might never reach Idaho except by artificial spread. The winds blowing up and down the Columbia might prevent the spread into Oregon for ten or fifteen years.

Only last year we heard about the slow spread to the south. Yet Yachats in Lincoln County, and the Hot Springs fork of the Callawash in Clackamas County are a whale of a distance from Vancouver, B. C.

Blister rust prophets have hidden their heads in gopher-

holes. They will soon be out again, however, telling us when to expect blister rust in California.

Blister rust prophets and weather prophets are apparently in the same class.

ERADICATION ON ASSOCIATION LANDS, BIG CREEK CAMP
SUMMER 1928

Type	Total Ribes Pulled				Acres	Ribes per Acre
	R.lacustre	R.visco.	G.inermis	Total		
Dense Mature	49,640	25,609	5,020	80,269	1,863	43
Open Mature	87,171	23,206	1,719	112,096	2,277	49.2
Dense Pole	1,314	500	61	1,875	196	9.6
Open Pole	1,302	71	89	1,462	120	12.2
Dense Repro.	286	160	-	446	133.25	3.3
Open Repro.	14	-	-	14	3	4.7
Cutover Mature	131,227	195,067	2,115	328,409	2,737.15	120.0
Stream	46,217	8,150	58,374	112,741	399.85	282.0
Scouted Out	-	-	-	-	728	-
Total	317,171	252,763	67,378	637,312	8,457.25	75.4

SUMMARY OF ERADICATION COEUR D'ALENE NATIONAL FOREST
SUMMER 1928

Type	Total Ribes Pulled					Acres	Ribes per Acre
	R. lacustre	R. visco.	G. inermis	R. petiolare	Total		
Dense Mature	15,407	343	13	-	15,403	182.10	84.6
Open Mature	164,613	7,991	120	-	172,724	586.6	294.4
Dense Pole	21,050	7,497	197	-	28,744	695.35	41.3
Open Pole	34,689	13,528	-	-	48,217	1,042.65	46.2
Dense Repro.	24,793	8,867	-	-	33,660	345.6	97.4
Open Repro.	24	593	-	-	617	.9	687.8
Cutover Mature	71,955	81	1,190	-	73,226	226	324.0
Stream	344,325	1,962	58,847	125	405,259	721.07	562.0
Scouted Out	-	-	-	-	-	5,540.03	-
Total	676,496	40,862	60,367	125	777,850	9,340.3	83.3

NOTE: Ribes per acre for acreage actually worked by crews - 204.7

NOTES

G. B. Posey and S. N. Wyckoff spent the week commencing September 16 with Offord at Berkeley making plans for an enlarged investigative program for chemical eradication.

W. V. Benedict became the proud father of a son on September 29. Heartiest congratulations, Benny.

* * *

The August expense account of W. T. Lund, one of Goodding's assistants, shows that he scouted near Whiskey Ridge, Oregon. We wonder what connection there is between this ridge and Still Creek, the eradication camp site.

The next day Lund left Still Creek for Whiskey Ridge with a pack horse!!

No! Goodding says his jobs are all taken for next year.

* * *

G. B. Posey left Spokane for Washington D. C. on September 25th. We enjoyed the personal contact with Posey and much benefit was derived from his visit. Come again, Gilbert.

* * *

Frank Patty was married on September 19; Bill Guernsey on October 17. Congratulations boys.

Patty is staying at Berkeley this winter, working in the Botany Department of the University of California on studies of the morphology of Ribes. Guernsey is back in the Spokane office, looking about the same except that he has lost some of that far-away look.

* * *

Putnam and Joy are at present on a tour of inspection of the Coast study plots, including the usual trip to Cheekye to check over the planted pines.

* * *

Reconnaissance note: "This section will eventually probably have nearly all white pine."

* * *

Seen on an expense account: "Travel performed in a government subsisted car."

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OFFICE OF
BLISTER RUST CONTROL
BUREAU OF PLANT INDUSTRY

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WESTERN BLISTER RUST

NEWS LETTER

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U. S. Department of Agriculture
Bureau of Plant Industry
Western Office of Blister Rust Control
Spokane, Washington

INVESTIGATIVE WORK ON THE CHEMICAL ERADICATION OF RIBES

H. R. Offord

During the past four years some two hundred spray formulae have been tested as Ribicides over permanent experimental plots in northern Idaho. At the conclusion of the 1928 field season sodium chlorate had given by far the best results of any of the chemicals tested as Ribicides.(1) A 100% kill of Ribes petiolare can be obtained by a single application of sodium chlorate spray (20%) to the aerial parts. The roots are completely killed by this treatment. Grossularia inermis and R. lacustre, on the other hand, are not completely eradicated by one spraying of the sodium chlorate. Considerable sprouting takes place from the crowns of both species and two or three applications are frequently necessary before a 100% kill is accomplished. Sodium chlorate has the further disadvantage of being inflammable, particularly if it is in intimate association with finely powdered, or dry organic material. Application of this chemical over areas of stream type, or over areas where the humidity is high, does not appreciably increase the fire hazard over that represented by the presence of a large amount of dead and dried out brush. There is, however, a decided risk to the men applying the spray inasmuch as the cellulose of clothing material forms a highly combustible mixture with sodium chlorate and may become ignited by friction alone. The aforementioned factors must be considered in the light of a large scale application, and in view of the urgent demand for chemical eradication methods in stream type the Office of Blister Rust Control deemed it necessary to speed up the investigative work on Ribicides.

Since the spring of 1926 the difference in susceptibility of R. petiolare on the one hand, and R. lacustre and G. inermis on the other, has been used as the entering wedge to the problem. Laboratory work and field experiments have centered about this fact in an attempt to explain the mechanism of action of sodium chlorate on Ribes and the conditions under which that action is optimum. It is rather pertinent to this discussion to give a short summary of the data obtained on the action of the Ribes species to sodium chlorate.

Following the initial observations on the differences in susceptibility it is now apparent that R. petiolare can be completely eradicated by using a 10% solution of sodium chlorate if the spray is made slightly acid. Efficiency on G. inermis and R. lacustre is increased if the spray is made alkaline (1N) while an acid solution (1N) reduces that efficiency. Alkaline chlorate solutions are not so effective as acid chlorate solutions on R. petiolare. Results of the spray on different Ribes can be markedly changed by adjusting the pH value of the solution.

Experiments on several California Ribes have shown that sodium chlorate is rapidly and evenly distributed throughout the tissues if cut stems are placed in the salt solutions. Differences in the rate of uptake have been observed but the final results are the same for both currants and

(1) The term Ribicide has been suggested by the reading of W. S. Regan's reports on the work done in eastern U.S. The writer advocates the use of this concise and etymologically sound word in official proceedings.

gooseberries. The same holds true if dilute chlorate solutions are added to sand or water cultures on which vigorous and healthy Ribes are growing. When the chemical is sprayed on the aerial parts, however, differences in susceptibility are invariably shown.

Quantitative chemical analysis of leaves and stems of the four important Ribes species of northern Idaho suggests differences in the suberin-cutin and lignin fractions. Reducing sugars and tannins also showed some variations. Examination of Ribes leaves gathered last spring at Bovill, Idaho showed that R. petiolare (most susceptible to sodium chlorate) contained 2-4% tannin, while R. lacustre (very resistant to sodium chlorate) contained 8-12%. Starches, total sugars, pentosans etc., showed no significant difference upon quantitative determination.

The reaction of sodium chlorate on R. petiolare is consistent over the entire growing season. G. inermis and R. lacustre on the other hand are decidedly more susceptible to early season treatment and a very noticeable diminution of toxic effect is noticed if these species are treated late in the growing season.

These data indicate that differences may be due to (1) protective tissues which prevent the chlorate from entering the vital tissues (2) plant buffers which are capable of rendering the sodium chlorate inactive (3) structural differences which allow the extensive movement of the chlorate in one case of one species and keeps the chemical effects rather localized in others.

In order to study these problems, an enlarged program of research work has been started at Berkeley, and purposes to develop a Ribicide which shall combine effectiveness on Ribes, safety to the man applying it, and a minimum fire hazard of the killed brush following application. The Utopian Ribicide may be a modification of the chlorate spray or it may be a new killing agent entirely. Work has been organized along physiological, morphological and chemical lines.

The morphological side of the problem is being attacked by Mr. F. A. Patty with the assistance of Mrs. Irma E. Webber. Mrs. Webber has been employed for this work because of her thorough knowledge of microscopic technique and her experience in the interpretation of histological data. The purpose of this subproject will be to gain first of all an intimate understanding of "normalcy" in Ribes tissue, and later on, to examine treated bushes in the light of this knowledge. Professor T. H. Goodspeed of the Botany Department is assisting in the organization of the work.

Through the cooperation of Professor J. P. Bennett of the Division of Pomology, this office has secured the part time services of Mr. A. S. Crafts for physiological studies on Ribes. Crafts has had considerable experience in this sort of work and has developed a binocular microscope which enables him to dissect and at the same time examine the tissue under the lens. The movement of sodium chlorate through the Ribes plant and the action of that poison on the elaborated food products is being studied by means of this instrument.

The chemical work is being conducted as before through the cooperation of professor D. R. Hoagland of the Division of Plant Nutrition. Mr. Van

Atta and Mr. d'Urbal are attempting to ascertain the chemical action of sodium chlorate on the various fractions which gross analysis has shown to occur in different amounts in G. inermis and R. petiolare. Chemical experts are paying particular attention to hygroscopic agents which might be added to chlorate sprays. New spray formulae will be tested out on potted Ribes and on Ribes growing in the vicinity of Berkeley as rapidly as they are developed in the laboratory. Recent laboratory work has suggested a kerosene emulsion of sodium chlorate, the kerosene being used as a vehicle to carry the chlorate to the place where it can do its work. It is apparent from previous investigations that sodium chlorate is just as effective on gooseberries as it is on currants once the chemical has gotten into the xylem. If the resistance of G. inermis is tied up in the protective tissues or in a smaller leaf surface area per foot of live stem, we can assist the chlorate in its job of penetration by rendering the tissues more permeable. Our success on this point depends upon a knowledge of the protective tissues and the chemistry of the permeability of those tissues.

Compounds containing complex ions of the heavy metals represent another field of possible Ribicides which have not as yet been thoroughly tested. In the simple form, the heavy metals are rapidly precipitated by tannins and other reducing agents present in the Ribes tissue. In the complex form these salts are not precipitated, and it may be possible to get these compounds past the protective barrier of tannin into the living parenchyma.

The entire investigative program is under the supervision of the writer. His duties consist of a correlation of the experiments and the interpretation of the data of the three subprojects in such a manner as to focus the efforts on the major issues of the field problem. Research work is continually opening up new fields of Ribicides and the writer is hopeful that in the not distant future a Ribicide will be found that will be equally effective on all Ribes. Methods studies have shown a definite need of chemical eradication in the local control program. A satisfactory Ribicide must be found.

PRELIMINARY SURVEY OF RIBES AND WHITE PINE CONDITIONS IN RAINER NATIONAL PARK

C. C. Strong

P. S. Simcoe and the writer recently made a preliminary survey of Ribes conditions on certain areas of the Rainer National Park where the Park Service may be interested in protecting stands of timber in which western white pine constitutes varying percentages. The work was done following a request by Mr. Tomlinson, Park Superintendent, who was interested in knowing the probable cost of protection against white pine blister rust should it seem desirable to do such work.

Distribution of White Pine in the Park.

White pine is sparsely distributed over much of the park area up to 5,000 feet elevation. However there are limited areas on which white pine makes up from 10 to 75% of the stand. It is on these latter areas, where the destruction of white pine would be a decided loss from the aesthetic standpoint, that protection should be done. One such area is immediately

surrounding the National Park Inn at Longmire Springs. Another is in the Silver Forest near Paradise Valley. The Silver Forest is an area of several hundred acres where fire has swept thru a stand of Alaska Cypress or Yellow Cedar resulting in a forest of white snags. An excellent stand of white pine reproduction has come in together with several other species. Two other valuable stands of white pine are located on White River within the park boundaries, near the White River entrance. One of these is a dense stand in which 75% is white pine about 60 years of age. The area is about 15 or 20 acres and was originally a small burn. The other area is perhaps 40% white pine of the same age, constituting about 75 acres.

Ribes Conditions

Ribes bracteosum, R. sanguineum, R. acerifolium, R. lacustre, and Grossularia divaricata are the Ribes species represented. Only one or two areas constituting about 150 acres have Ribes in addition to the stream type. On this 150 acres, however, working conditions are severe and Ribes are very dense. The balance of the Ribes are largely on stream type or bordering flats constituting about 345 acres. U-shaped valleys are the rule on large streams due to the glacial action which has so recently taken place and which is still taking place at higher elevations.

If eradication is attempted it may not be desirable to use chemicals due to the probable damage to vegetation other than Ribes. This will tend to make the cost of protection somewhat greater.

The men who made the survey feel that protection is highly desirable and practical. Loss of white pine on the park will be a serious matter.

It was quite noticeable on areas which had been burned over in the last 60 or 70 years that white pine seems to be gaining very rapidly over original stands where natural reproduction has not been interfered with by subsequent fires. This is deemed a decided argument for white pine as a future forest crop.

MAPPING BY AEROPLANE

W. A. Rockie

The present trend of development points to the early completion of an aerial photograph of the more inaccessible forest regions of the United States.

From the standpoint of actual value, the aerial photograph of a forest region gives the most perfect visualization of that area that can be made by any means now known.

The age class and timber type lines are generally so easily followed that the painful ground mapping now in vogue appears in a rather unfavorable light. In the present ground mapping, most of the actual age

class and type lines must be "guessed in", instead of the very definite lines that one sees on the aerial photograph. These definite lines cannot be incorrectly located.

By going one step further, and using the stereoscopic camera for taking the aerial photographs, the relief of the land can be made to stand out to a degree that is impossible with the ordinary camera.

This aerial photo has been tried out in many lines of extensive forest mapping, and in some lines of more intensive work.

The writer had the pleasure of examining the aerial photos of some areas with which he felt familiar, and was surprised to see the many more details that could be gained regarding the area than from a very careful ground examination. The Rocky Mountain Forest Experiment Station has been completely mapped aerially, and some very fascinating hours can be enjoyed studying this area with which many of us are acquainted. The writer learned more about the details of the Experiment Station area in a few hours from the map than he could learn from many days of field examination of the same area.

Mr. Howard Flint, the Forest Service aerial observer and photographer, has us all backed off the map when it comes to knowledge of north Idaho.

It would appear that this new method of mapping might be adaptable to the needs of pre-eradication. At least it appears to offer sufficient possibility of decreasing the cost of pre-eradication that a sample area might be tried.

NOTES ON A SCALE INSECT ATTACKING WHITE PINE

E. E. Hubert

While inspecting the experimental plots of the ecology crews, Office of Blister Rust Control, in the vicinity of Harvard, Idaho, on July 2 and 3, 1928, several white pines in the area were observed to have individual small red flags caused by the death and discoloration of the needles at the tips of certain twigs. In very few cases were the entire ends of the branches discolored. Some of the branches showed only the older needles discolored and the 1928 needles green and in good condition. Suopressed young trees showed this red discoloration to a greater extent than did the larger and thriftier trees.

Examination of the twigs disclosed many tiny scale insects attached to the young bark and to the bases of the needles. The twigs so attacked were usually slightly swollen and the needle bases were considerably enlarged, resembling somewhat the larch needle spurs. Only those twigs which bore the insects showed discolored and dying needles. A similar disease was noted in northeastern Washington and in southern British Columbia in May, 1928. In the vicinity of Salmo, B.C., the damage to white pine is considerable, many trees are dying and some are already dead.

A trip into the logging area of the Edward Rutledge Timber Company near Clarkia, Idaho was made on July 6 to 8, 1928.

The white pines, particularly those along the streams and in more exposed sites, show light attacks of the scale insect. The lower crowns show the characteristic discoloration accompanied by swollen twigs and needle bases. The damage is of minor importance at this time, since the white pine in the denser timber where logging is being conducted shows little signs of the scale. This type of injury should be carefully watched, however, as favorable seasons may cause the development and spread of large numbers of these insects.

A trip into the Clearwater region in the vicinity of Pierce and Headquarters, Idaho made on July 9 to 12, 1928 disclosed the presence of the white pine scale on marginal and badly suppressed trees, but the infestation in no case went beyond a few branches in the lower crown. The few reddish tips of branches and discolored portions of the lower crown were very pronounced.

The value of the report on this disease ties in the fact that as soon as the white pine blister rust becomes distributed in Idaho and scouts are sent out to locate the areas of infection, it will be necessary to know in advance the characteristic "red flag" and discolorations produced by this scale insect in order to distinguish them from the "red flags" and coloring of the crowns caused by the blister rust fungus.

SHEEP TRAILS SPRAYED WITH CHEMICALS

G. A. Root

While spending several days annual leave in Utah, there came to my attention the use of sodium chlorate to remove burr plants from state designated sheep trails. These plants, burdock and cocklebur, adhere to the bodies of the sheep passing through and cause a decrease in the value of the wool. Furthermore, this furnishes an excellent means for the dissemination of the noxious weeds.

"One-half pound of the chemical to one gallon of water was sprayed on these plants at the time when they were beginning to bud, resulting in a complete kill", said the Utah official.

That accidents from burning in the use of the chemical have not been confined to members of the Blister Rust Office is attested by the statement that one Utah employee was severely burned by the drying out of his shoes, spontaneous combustion having taken place while walking. In Idaho one man was burned to death and five more severely burned, but no details were given as to how this occurred.

Mr. Offord has been apprised of the Utah experiments and is in correspondence with the agricultural inspector.

BLISTER RUST WAVES OF INFECTION AND THEIR SIGNIFICANCE IN THE INLAND EMPIRE.

H. N. Putnam

I. Introduction

I will attempt to develop this topic first by a discussion of what constitutes a wave of infection, then by a brief resume of the different waves of infection in the West and finally by offering an opinion as to the significance of the present known spread of blister rust in the Inland Empire.

II. Explanation of a Wave of Infection

I will reconstruct the probable history of the Newman Lake infection, with which we are all more or less familiar, as an illustration of a wave of infection. This infection originated in 1923, which was the year of origin of two infections near Nelson, B. C., of several infections in the Cascades of Washington and at least one infection in Oregon. Hence it may be considered as a very good representative infection.

The history of an infection can be read from an analysis of stage of canker development and year of growth infected. I will show the story in tabular form.

TABLE NO. 1

PROBABLE HISTORY OF NEWMAN LAKE INFECTION
NEWMAN LAKE, WASHINGTON.

Stage of Development	Range of Dates For Each Stage	Typical Date Each Stage Formed	Ave. Time Between Successive Stages
Aecial infection of Ribes	May 15 to July 1,1923	June 1923	
Infection of pines	June 15 to Oct. 15,1923	Sept 1923	3 months
1st Symptoms on pines	October,1924 to May,1926	May 1925	1 yr.9 mo.
Juvenile Cankers	May,1925 to October,1926	Oct.1925	5 months
Cankers Producing 1st Pycnia	June,1925 to June,1927	June 1926	8 months
Cankers Producing 1st Aecia	April,1926 to April,1928	Apr.1927	10 months
Cankers Producing 2nd Aecia	April, 1927 to April, 1929	Apr.1928	1 year

Analysis of the cankers found at Newman Lake last spring showed them to be clearly of 1923 origin. The majority of them were producing aecia for the second time, while a few were in the first year of aecial production and some were showing aecia for the third successive year.

The range of dates in which the different stages may occur, while

confusing in itself, is included in the table to show that aecia were produced in 1926 three years after infection, altho the main body of cankers fruited for the first time in 1927. It required then, from 1926 on, only a wet season favorable for the development of the rust, to renew the stage of infection and cause further spread. In this connection bear in mind that I am considering only a wave of infection originating in 1923. As we know, the seasons of 1927 and 1928 were both moist seasons, presenting conditions favorable to rust development. Furthermore, there was an abundance of aecia produced in each of these years, particularly in 1928.

Hence it is evident that there are two factors favoring the spread of the rust and accounting for the waves of infection. These factors are: (1) precipitation distributed thruout the spring and summer months; (2) abundant production of aeciospores. I have tried to show that there are many cankers developed in a single favorable year, that these cankers produce aecia in abundance from three to five years after infection, and that a wet season coming at the proper time favors a wide spread germination of such aeciospores. These characteristics of the disease result in a new wave of infection every three or four years.

III. Waves of Infection in the West

I will discuss briefly the main waves of infection known in the West since the rust was introduced.

1910. Blister rust probably introduced into Vancouver, B. C., on white pines shipped from a nursery in France.

1913. The rust from the imported infected pines had become established at Cheekye, B. C., Daisy Lake, B. C., and at other points in the general vicinity of Vancouver, B. C.

1917. The rust jumped the Dry Belt to vicinity of Revelstoke, B. C., east of Vancouver, B. C. It had also become established in the northern Cascades of Washington on the Upper Skagit River.

1920. By this year the rust had established itself at Nelson, B. C., which is southeast of Revelstoke. It had reached the southern Cascades of Washington as far south as Spirit Lake, in Skamania County. It was present on the Olympic Peninsula of Washington at Bremerton.

1922-1923. These two years were both favorable for the spread of the rust, which entrenched itself at Newman Lake, Washington in the Inland Empire. It had also reached the northern Cascades of Oregon.

1927-1928. Scouting during these two years has shown the rust to be well distributed thruout the western white pine belt of the Inland Empire, and present thruout the major portion of the northwest quarter of Oregon.

In this brief account of the periodic spread of the rust, I

have mentioned only its invasion of new territory. It must not be forgotten that while the rust has been extending its limits, it has also been busily engaged in intensifying itself to a corresponding degree in the vicinity of each infection point, thus periodically producing larger volumes of aeciospores.

IV. Situation in the Inland Empire

As previously stated, blister rust is abundantly present thruout the white pine belt of the Inland Empire. So far it has not been found on pines in Idaho, but judging from the fact that concentrations of infection on Ribes were found on the East Fork of St. Maries River, and on Elk Creek, it is believed that undiscovered pine infections exist in these two vicinities.

In 1928 there were 32 Ribes infection points found. At three of these points the nearest pines were 400 feet from infected bushes; at two points pines were 200 feet distant; and at each of the remaining twenty-seven points pines were within 100 feet and often within 10 feet of the infected bushes. This condition cannot help but result in the production of aeciospores thruout the Inland Empire in three or four years. It is beyond dispute, owing to the large masses of susceptible Ribes species growing in close association with pines, particularly in the southern and optimum range of western white pines, that the rust will rapidly intensify itself in the near future, and constitute a serious and ever increasing menace to the western white pine.

V. Conclusion

In concluding this paper, I wish to repeat for emphasis several points.

1. It takes three or four years after infection for a canker to reach the fruiting stage. An abundant production of aeciospores coupled with a wet spring and summer result in a heavy wave of infection whereby the rust extends its limits and intensifies itself.

2. The rust was introduced into the West in 1910 at Vancouver, B. C. During the last 18 years it has spread by five major and ever larger waves of infection into northwestern Oregon, and thruout the western white pine belt in the Inland Empire. In 18 years the rust has increased from a few cankers to probably several millions. I leave to your imagination what will be the status of the rust at the end of the next 18 years. It increases in almost a geometrical progression, limited to a certain degree by the death of infected trees.

3. The rust is well distributed over the white pine belt of the Inland Empire. At each of the thirty-two infections found pines were sufficiently close to receive infection from infected Ribes species. In three or four years we may expect another wave of infection resulting from cankers originating this year.

NUMERICAL DESIGNATION OF PROJECTS

In order that the newer members of the office may become familiar with the method of designating the several projects of the Western Office of Blister Rust Control we are printing the numbers used for the general headings of our work, with the decimal system used for their subdivisions.

Delay Program - 1
- Cultivated black currant eradication - - - 1.1
- Nursery inspection and sanitation - - - - 1.3

Methods Work - 2
- Reconnaissance methods - - - - - - - - - - - 2.1
- Eradication methods - - - - - - - - - - - - - 2.2
- Experimental chemical eradication - - - - 2.3
- Ecology - - - - - - - - - - - - - - - - - 2.4

Control Application - 3
- Reconnaissance on Federal lands - - - - - 3.1
- Eradication on Federal lands - - - - - - - 3.2
- Reconnaissance on private lands - - - - - 3.3
- Cooperative Ribes eradication - - - - - - 3.4

Spread and Damage - 4
- Spread of the rust - - - - - - - - - - - - - 4.1
- Damage to pine - - - - - - - - - - - - - - - 4.2

Education - - - - - 6

Office - - - - - - 9
- Supervision - - - - - - - - - - - - - - - - - 9.1
- Maintenance of Field Office - - - - - - - - 9.2
- Miscellaneous Supplies - - - - - - - - - - - 9.3

In addition to the above designations the following numbers are used for the states concerned: Montana 1, Idaho 2, Washington 3, Oregon 4, California 5. Thus cultivated black currant eradication in California has the designation 1.15, reconnaissance on Federal lands in Idaho is 3.12.

* * * *

Mr. A. E. Franklin, who has been conducting a black currant survey on the Coast during the past summer, returned to the Spokane Office on November 14.

The life of a black currant man is no bed of roses but to one who has a sense of humor the day's work brings many interesting situations. One lady listened quite patiently, but with a far away look in her eyes, while Franklin explained blister rust, black currant work, etc. When he had finished she remarked, "I don't believe I care for any today, thank you."

UNUSUAL TIME FOR AECIAL PRODUCTION

H. N. Putnam

On October 14, 1928, Mr. E. L. Joy and myself obtained a blister rust canker producing aecia on a ten-inch planted pine at Cheekye, B. C. There were three blisters present, two of which had broken, and one with the peridium still intact. This pine was planted in May 1926. Hence the fruiting canker must have developed in not over two years and five months after infection.

This canker is unusual from the standpoint of rapidity of development as well as the time of year aecia were produced. It is needless to say that aecia produced in October cannot materially aid blister rust in its spread.

SUMMARY OF BLACK CURRANT ERADICATION CALIFORNIA-1928

County	No. Plantings	No Bushes
Alameda	103	630
Monterey	6	22
San Luis Obispo	3	5
Santa Cruz	37	847
San Francisco	7	98
San Benito	0	0
San Mateo	39	196
Kern	0	0
Santa Clara (very small section)	2	3
Contra Costa*	1	5
Total	198	1,808

*"Hold-over" from 1927.

NOTE: In the above, for Santa Cruz County, is included one planting of 600 bushes reserved for chemical experimental work. Mr. Offord's forces will get at these next spring.

BLISTER RUSTER SEES HIS FIRST FOOTBALL GAME

"Going to the game, Mac?" Why do they ask me that question all the time? They know I've never seen a football game. Maybe I ought to see one and find out what all the excitement's about.

Say, Bill, how long do they play in this game? One hour playing time? Let's see, I have to meet my wife at 3:30. Guess I can make it all right.

2 o'clock! Nice kick! and look at that guy run--no, he's downed! Why do they have a pile-up there? What's the matter with those last two--don't they think that guy will stay put, without

them jumping in the air and landing on the heap? I guess a man has to be a combination high and broad jumper to be good at this game.

Another pile-up--this game is just one pile-up after another. Heck, we put on better rough houses when I was a kid and didn't charge for them either. Oh, that's better. Forward pass,eh? It was a dandy. Three fellows jumped for that one but the little fellow beat them to it. Why do they go back there? Oh, one player has to catch it. Why didn't he try to then instead of just hitting it with his fist?

Bang, there's the gun! You say that seemed like a short quarter? How long is a quarter? 15 minutes? Oh, let's see--2:30. Yes, that was a short quarter. Gosh, I'm going goofy too.

Why, they're at it again! I suppose they turn around just so they can get untangled and let the crowd see the ball again. Clever idea, that!

More rough house--nice one, that time. There's the referee calling those birds out to measure the ball. Seems to be the same size as it was before. They're still playing with it anyway. Not much chance for cheating in this game--three white shirted birds on the field and three on the side lines keeping measurements. Haven't they ever tried the Honor System?

They made it? Made what? They're still in the middle of the field. Oh, made their ten yards, first down. No they didn't either. I distinctly saw them go down four times and you just said "Fourth down, they'll have to make it this time". Then you say they made their first down. How do you figure that out? What, you don't know? So do I.

There's the umpire measuring the ball again. Fussy old birds, aren't they? Off tackle play, eh? Poor tackles, they are having a lot of plays taken off them.

Bang! He missed them--they all got up again. Half time! There's another half hour of fifteen minutes shot.

Well, here they go. What's the crowd yelling at the referee for? Poor old fellow. There he goes for a hike with the whole brigade trooping at his heels. Gosh! he's tired already. There, he set the ball down. What? Oh---Oh---Oh, pardon me, my mistake.

Well, looks as if he's going to kick--no, forward pass--great stuff! He's past them all. Touch down. Pretty easy, eh? Why do they start in at the end of the field again. Oh, try for point. Oh, I see. Boy! some kick! Just half way between the post and the side line. Say, is that good or rotten?

Those big fellows are pretty soft. Look at them huddling together to keep warm. The blue team doesn't have to do that. I hope they win.

Boy, they're fighting! Look at that little fat fellow grab the ball from the big guy and how he does work! Atta boy! What's the crowd laughing at him for? Oh, the ball was dead, eh? Does that mean they'll have to measure it again?

There's the gun. Last quarter? Well, they're at it again. That boy is going to kick first time. Oh, he's a punter? All round athlete, eh? I used to do a little canoeing, do you think that would help in this game?

Forward pass! a dandy! Boy, that fellow had to jump to get

out of the way of the ball. Why didn't he catch it? He's ineligible? Why don't they kick him off then? Perhaps he ought to study harder or something. Must be pretty hard to wander around out there and not be able to get in the game. I would have caught that ball anyway, and say, why do they have the big army on the bench and put an ineligible guy out there?

Bang! There's the final gun. The big fellows won? Well, I'll take your word for it. That was a great game, though. Wish I knew what it was all about.

Holy old bald-headed Ike! Four o'clock! I thought you said they only played an hour. Gosh! I forgot all about my wife. Well, it's too late to meet her down town. I guess I might as well go home and face the maledictions and castigations of my marital mate. I enjoyed the game--but you know,--Love, Honor, and Oh Boy!

NOTES

Strong and Simcoe spent October 13-20 on pre-eradication work in Rainier National Park.

* * *

E. L. Baxter left for Corvallis on November 5 where he will help Goodding to summarize data on the Oregon work.

* * *

Born--on November 7 to Mr. and Mrs. Remley E. Myers, a daughter. Congratulations, Chief!

* * *

S. N. Wyckoff left for California on October 28 to confer with Offord on the chemical investigative program.

* * *

T. H. Harris left the Spokane Office on November 7 for Berkeley where he will help Patty in working up the California ecology data.

* * *

Anderson, Calhoun and Strong spent November 10-11 deer hunting. No one is growing fat on venison as yet.

* * *

Riley states that his answer to the slanderous remarks of Anderson and Guernsey, in the October issue, is a dignified silence.

* * *

Statement noticed in checking the summer's requisitions: "25 lbs. pancake flour for the cat." Calhoun says it reads "for the lot." Maybe, I dunno. Appearances <u>are</u> deceitful.

Vol. 3 December 15, 1928. No. 12

WESTERN BLISTER RUST

NEWS LETTER

* * *

Confidential

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U. S. Department of Agriculture
Bureau of Plant Industry
Western Office of Blister Rust Control
Spokane, Washington

RIBES ERADICATION IN NORTH IDAHO - 1928

C. C. Strong

Previous to the 1928 field season Ribes eradication in North Idaho was confined to one locality each year. It was necessary to carry on this type of work in several general regions in order to obtain information which would apply generally. Consequently the work done in the period 1922-1927 inclusive applied to 5 general localities.

It was recognized from the beginning that sooner or later this work would have to be decentralized and that the organization would ultimately call for a separation of the experimental methods work from the practical work. This decentralization and separation began in 1928. Hand pulling experimental and methods work was largely confined to the two units employed on the Coeur d'Alene National Forest. The work of applying chemicals for destruction of Ribes was carried on at Bovill, Idaho. Ribes petiolare was the principal species existing on this area. The area selected contained exceptionally heavy Ribes concentrations and was ideal for experimentation with the various types of spraying equipment developed.

The only wholly practical organization in the field was the hand pulling unit engaged on state and private lands at Big Creek, Idaho. In addition to being a practical job, this is the first instance where private funds, in any appreciable amount, have been appropriated for Ribes eradication in the West.

The following table shows the progress of Ribes eradication in 1928, with the exception of the work done at the Savenac Nursery in Montana. In addition, the total results of Ribes eradication for the period 1922-1928 is shown:

Eradication Type	Number of Ribes Destroyed	Average Number Ribes per Acre	Total Acreage Covered
Dense Mature	36,305	17.7	2,045.10
Open Mature	284,820	99.5	2,863.60
Dense Pole	30,619	33.1	891.35
Open Pole	49,679	43.6	1,162.65
Dense Reproduction	34,106	71.2	478.85
Open Reproduction	14	4.7	3.00
Cutover	400,635	135.0	2,963.15
Scouted Out	No Ribes	-	6,268.03
Stream	633,036	443.4	1,427.52
Stream Sprayed	10-15%	Concentration	230.76
Acreage protected by Spraying			9,461.20
Total	1,469,214	81.2	27,795.21
Total 1922-1928	4,632,119	83.8	64,986.41

A new phase of the experimental work was begun in 1928.

This was the experiment in re-eradication carried on in the Lamb and Binarch Creek drainages where original eradication was done in 1926. A small crew was employed in 1928. Where the original average cost of eradication per acre for all types was $1.26 the cost of re-eradication was $.94. This cost would have been lower in 1928 but for the fact that crews were instructed to work all areas according to usual crew methods regardless of whether or not only few Ribes were found on certain areas in 1926. In a sense this 1928 re-eradication was a large scale check upon the original job as well as a study of Ribes re-generation following the original job.

In 1926, 42.8 Ribes bushes per acre were pulled. In 1928 re-eradication, 12.6 bushes per acre were pulled. Of these 12.6 bushes however, 6.9 (55%) were bushes which had reproduced since 1926.

NOTES ON EXPERIMENTAL CHEMICAL ERADICATION.

H. R. Offord

A water culture, the formula of which is being kept secret until large scale application of chemical methods have made R. petiolare a rare species, has proven very successful for the rapid propogation of the infamous wild black currant. Tall and majestic stems, large and verdant leaves, and excellent root development are silent but impressive evidence of the efficacy of the secret formula. The writer feels that the idea can be used to good advantage by his married blister rust friends, whose cheerless tenement homes may be brightened by the presence of a few green plants tastefully arranged in the form of window boxes or placed in a well disguised milk bottle in the center of the table. In addition, friends would be serving the cause, since greenhouse space is rather limited at Berkeley and the writer is anxious to keep a good supply of green material on hand. The more intelligent members of the staff who plan to devote their spare time to this fascinating study may obtain the secret formula and a list of the experiments to be performed on the plants by mailing a stamped and self-addressed envelope to my Berkeley office.

As this paper goes to print two schools of thought, which might be termed the "laissez-faire" and the "carpe diem", are waging scientific warfare at Berkeley. The former believes that the most effective spray should remain on the leaves and stems of the Ribes over a long period and move along with the organic nutrients. The supporters of this theory place their hopes on "Complex Ion" who is supposed to get away rather slowly from the barrier and wear down the opposition with a slow but persistent stride. The "carpe diems" have mortgaged their "Big Game" tickets for the next three years and place everything on "Water Deficit" who leaves the barrier like a flash, takes one big breath of air and reaches the tape in one (not more than two) bound(s). All bets should be placed before the field season begins and are subject to the usual 10% discount.

For the benefit of young chemical eradicators who enjoy games of skill and daring, the research staff has determined the flash point of dried Ribes leaves after the leaves have been sprayed with sodium

chlorate. The flash point has been determined before and after removal of the surface chlorate. Clothing will be tested in a similar manner. Preliminary data showed a range between 140-200 C. for the leaves. The complete data are intended for crewmen who will not change or wash their clothing and will give them valuable information on how long it is advisable to stand over the cook stove.

Operations on various parts of Ribes anatomy are still in progress. The rotary microtome has been doing good work in spite of some trouble which was experienced with the anaesthetic. Plasmolysis experiments show that sodium chlorate is very active even in its weaker moments and countenances no comeback on the part of the cell.

AN EXAMPLE OF FOREST SERVICE COOPERATION

Newport, Washington
November 3, 1928

Mr. H. N. Putnam
Associate Pathologist
Spokane, Washington

Dear Sir:

Reference is made to your letter of November 1.

The contributed time of your men during the past season more than offsets the cost of the meals furnished them by the Forest Service, and, therefore, we do not consider it necessary for you to make this payment.

We wish to express our appreciation of the splendid spirit of cooperation shown by you and your organization during the 1928 season.

Very truly yours,

(s) J. E. Ryan, Forest Supervisor
By E. M. Kapp.

During the past summer Mr. J. E. Ryan, Supervisor of the Kaniksu National Forest and his organization, have shown a fine spirit of cooperation with our scouting crews, the members of our personnel with whom they came in contact most. They supplied maps and information and did all in their power to further the interest of the work. Similarly, as evidenced by the above letter, the blister rusters were ready at all times to offer their services when needed.

This is one example. The same spirit has been shown on other forests. We are all in the business, and game, of conserving and building up our great forest resources. This cooperative spirit must have its effect in the winning of our common battles.

SUSCEPTIBILITY OF INLAND EMPIRE RIBES

At the monthly personnel meeting of the western office held in Spokane on December 12, Mr. J. L. Mielke of the Office of Forest Pathology, Portland, Oregon, gave an interesting talk on the susceptibility of the four main Inland Empire species of Ribes, R. petiolare, G. inermis, R. viscosissimum and R. lacustre.

The study of susceptibility of these Ribes which was commenced systematically on a large scale in 1924 was drawn to a conclusion this year. The purpose of the study was to determine the reaction of the species to heavy infection conditions and their capacity to produce teliospores, the spore stage thru which the pine-infecting sporidia are produced. Three growth forms were recognized for each species - open, partial shade, and shade. The test involved a total basis of 3,349,264 leaves produced on a total basis of 3,604 plants. All were subjected to heavy infection by aeciospores. The average extent of susceptibility measured in percentage of total leaf area which become covered by infection for each form of each species is shown as follows:

Growth Form	Species			
	R.petiolare	G.inermis	R. viscosissimum	R.lacustre
Open	27.15	20.96	5.79	3.57
Partial Shade	25.08	18.74	Insufficient basis	3.87
Shade	25.44	24.04	10.41	8.51

The percentage of total leaf area which bore telia were:

Growth Form	Species			
	R.petiolare	G.inermis	R. viscosissimum	R.lacustre
Open	23.98	9.65	2.88	.35
Partial Shade	24.65	15.67	--	.80
Shade	23.46	17.47	6.36	2.93

These figures, however, do not give the true relations between species for productivity of teliospores, for there were wide differences between species in the amount of teliospore production per unit of leaf area bearing telia. A laboratory study has yet to be carried out to give final values for these differences. Rough preliminary laboratory estimates for the purpose of this meeting gave general relative values for productivity in bulk of telial spore horns or columns per unit of telia producing leaf surface as follows:

Growth Form	Species			
	R.petiolare	G.inermis	R. viscosissimum	R.lacustre
Open	100	60	10	5
Partial Shade	85	70	--	6
Shade	75	80	15	7

Multiplying these values by the figures for the average percentages of surface bearing telia, the final relative average values become:

Growth Form	Species			
	R. petiolare	G. inermis	R. viscosissimum	R. lacustre
Open	2,398	579	29	1.7
Partial shade	2,096	1,097	---	4.8
Shade	1,759	1,398	95	20.5

This scale gives for the different species and forms a ready comparison of the relative estimated potential productivity of the pine infecting spore stage. It is immediately apparent that the first two species are infinitely above the latter two in this respect. For example, R. petiolare, open form, is approximately 1,410 times more productive than R. lacustre, open form; approximately 83 times more productive than R. viscosissimum, open form; approximately 25 times more productive than R. viscosissimum, shade form etc. The detailed laboratory study which will be made of a large basis of specimens collected for the purpose will give us more exact values for the average potential productivity in each form and species.

In the course of his disscussion, Mr. Mielke gave many other facts of interest to blister rust workers. One of these concerned the susceptibility of the earlier stages of Ribes leaf development. The results of a systematic study indicate that Ribes leaf tissues attain the peak in susceptibility generally within eight to sixteen days after the leaves unfold from the bud. This information is directly applicable in the analysis of the effect of early seasonal conditions on long distance spread of the rust to Ribes.

Details were given by Mr. Mielke of plot studies on the potential pine infecting capacity of the different species. The character of infection on R. peticlare and G. inermis and particularly R. petiolare, places them in a class with other highly susceptible wild species and not far below R. nigrum from concentrations and plantings of which extensive and damaging spread has occurred. There is no question of the necessity for the eradication of R. petiolare and G. inermis under practically any condition if associated pines are to be protected.

For R. lacustre and R. viscosissimum at the other end of the scale in susceptibility and telial productivity, there is every reason to believe that where these species do not occur in large numbers or where they are dying out through shading, the danger from them will be negligible. The question is, just how far is it safe to go in leaving these species under any particular set of conditions? For an answer it will be essential to know, in addition to their susceptibility, the degree and extent to which given amounts of infection on them will transmit the disease to the pines. In the general development of the control and investigative programs, the determination of this question has become the dominant phase of the investigation on Ribes.

PROGRESS RECORD OF RECONNAISSANCE WORK IN IDAHO

Unit	Area in Acres	Acres Worked 1923	Acres Worked 1924	Acres Worked 1925	Acres Worked 1926	Acres Worked 1927	Acres Worked 1928	Total Acres Worked to Date	% of Total Area Worked to Date
Clearwater, T.P.A.	702,760		1,195	3,430	38,400	60,160	144,853	248,808	35.40
Coeur d'Alene, T.P.A.	1,301,000*		786	6,911	46,240	48,640	111,360	213,937	16.44
Pend Oreille, T.P.A.	865,800		3,522	4,640	33,280	46,400		87,842	10.15
Potlatch, T.P.A.	705,261		6,204	3,920	39,164	62,400	95,330	207,018	29.35
Priest Lake, T.P.A.	237,000		18,632	23,260	37,945	107,391		187,228	79.00
Clearwater, N. F.	907,846						907,846	907,846	100.00
Coeur d'Alene, N. F.	790,234			106,360	251,746			358,106	45.32
Kaniksu, N. F.	657,620	5,510	22,106	25,310		147,182		200,108	30.43
Pend Oreille, N. F.	874,738					241,479		241,479	27.61
St. Joe, N. F.	867,450				37,850	426,860	39,957	504,667	58.18
Total	7,910,709	5,510	53,165	173,881	484,625	1,140,512	1,299,346	3,157,039	39.91

* Exclusive of lands within national forest boundaries.

IMPORTANT DISEASES OF WESTERN WHITE PINE (PINUS MONTICOLA)

B. A. Anderson

Human flesh is heir to many different diseases. Our bodies, with their complicated physiological structure may be racked with a host of aches and pains. And so also our forest trees are subject to a long list of tree diseases. We may complain of our rheumatic joints, varicose veins, dyspepsia, flat feet, halitosis, tuberculosis, and tobacco heart but our forest people have almost as many serious ailments peculiar to themselves. A tree doctor might find that certain trees depending on their species are afflicted with frost cracks, hollow heart, shaky butt, mistletoe, top trunk, or butt rot, fire scars, spike tops, galls, burls, or perhaps attacked by any one of a dozen devastating insects.

Our old friend, white pine, is no exception to the rule. From the time that the seedling gently pushes aside the earth and sees the light of day until the woodsman ends its growth, it wages a continual warfare for existence. The fungous diseases which attack living white pine may be classified as parasitic diseases and wound fungi. The former attack the living tissue of the tree and the latter attack the heartwood.

Parasitic Diseases.

Damping-off

Damping-off is a seed bed disease, where seedlings are grown close together and does not cause any appreciable damage in a natural forest seedling.

The principal fungi causing damping-off are *Pythium debaryanum*, Hesse, *Corticium vagum*, Band C, and *Phytopthora omnivora*, DeBary. Ordinarily they exist as saprophytes on decaying vegetable matter in the soil.

The seedling may be attacked at any time after germination until it reaches the age of one or two months by which time the hypocotyl has been transformed from a soft fleshy stem to woody tissue which resists further attacks.

The first symptom is a brownish, water soaked appearing lesion on the stem near or a little below the surface of the ground. Soon afterwards the decayed tissue collapses and allows the plant to fall to the ground. The appearance of the pathogene in the seed bed is soon marked by a dying out of seedlings throughout the seed bed. Its spread is accomplished by the growth of the mycelium thru the surface soil.

Usually one or more of the damping-off fungi is present in all soil but no appreciable damage may result if conditions are not favorable for their development. All damping-off fungi are influenced to a marked degree by: temperature, soil conditions, soil moisture, and humidity of the atmosphere. Development of the damping-off fungi is favored by fairly high temperatures, moist compact soil, and a humid atmosphere.

Damping-off can be successfully controlled by various seed bed treatments and correct cultural practices.

Shoe-string or Honey-mushroom Root Rot.

The shoe-string fungus, Armillaria Mellea, (Vahl) Socc., is found on a wide variety of hosts and occurs on both coniferous and deciduous trees. White pine is attacked quite as vigorously as any other host. Once a tree is attacked it seldom recovers. The progress of the disease is marked by undersize and scanty foliage, premature falling of the leaves, and the dying back of branches, and finally by the death of the tree. The fungus is able to live either as a parasite or saprophyte.

In coniferous trees the exudation of resin from the base of the tree usually accompanies an attack. The soil about the roots and base of the trunk may become a hard crust of fallen needles, dirt and litter, cemented together by this flow of resin. Upon close examination of the crown and roots, the following symptoms would indicate the presence of shoe-string root rot; (1) decayed areas of bark and wood; (2) white fan-shaped mycelial growth between the bark and wood or in the decayed part of the bark; (3) the most certain sign is the presence of shiny dark brown, or black cord-like strands which run from the infected area and ramify thru the soil about the base of the tree and may also be found replacing the mycelial fans. These strands or rhizomorphs are composed of closely compacted fungous tissue and together with the basidiosporea produced in immense numbers by the sporophores are its only means of dissemination.

The sporophores are produced from the decaying roots and stumps and from living hosts in the latter stages of decay. The fruiting bodies appear in the autumn and if the soil, humus, etc., is carefully separated from the sporophous, they will be found to be attached to the cord-like strands. Sporophores usually appear in clusters and are from three to ten inches long, honey-yellow in color with the cap bearing whitish gills. The stipe possesses a delicate annulus.

The saprophytic nature of the fungus is evidenced by its excellent growth on the dead material of the host several years after it has caused its death.

Needle Cast.

Needle rusts are important in that they retard the increment of the tree by destroying the needles. Tophodermium pinastri, (Vahl) Socc., occurs abundantly thruout the white pine type. The fruiting bodies appear as small, black spots or lines on the needles.

Pimple top, a nursery disease which, after killing seedlings, leaves the foliage with a purplish brown cast, may be a type of Tophodermium.

(To be Continued)

CRONARTIUM OCCIDENTALE AND CRONARTIUM RIBICOLA

L. N. Goodding

At present currants and gooseberries are blooming in southern California. Ribes aureum has an abundant crop of new leaves with some of the old crop still clinging. At this date, December 16, Cronartium occidentale, a first cousin of Cronartium ribicola, is not difficult to find, but it is mostly old leaves which show the pustules. Some of the oldest new leaves, however, are breaking out with the first tiny sori. It is clear that C. occidentale winters over in this climate. In fact the disease has apparently become so accustomed to this climate that it does not produce the abundance of telia so common in Nevada, Arizona, Colorado and other inland states. Of the entire number of infected leaves collected on December 6, about 10 per cent bore telia, some sparsely, some quite abundantly. In Colorado the last crop of diseased leaves bears nothing but telia or if uredinia are produced, they are formed with difficulty.

We are not certain that C. ribicola will act just as C. occidentale does under conditions such as we find in southern California. The fact that the two diseases act much alike under other conditions, however, justifies us in believing that we can expect much the same behavior from C. ribicola that we have observed in C. occidentale. We will not need to wait long to make comparisons. C. ribicola is only one or two jumps from southern Oregon where at least two Ribes, Grossularia cruenta and G. menziesii, have green leaves throughout the year. From there down to the southern limit of sugar pine the rust can keep busy on Ribes for 365 days of the year. Let us hope that it will be content with this and produce no telia. That will probably be true when the bees in this land of perpetual flowers forget how to sting.

CULLED FROM THE FILES

Dear Chief:

Thanks for information on rust on raspberry also Mr. Detwiler.

NOTES

W. A. Rockie and D. R. Miller spent November 27-29 at Harvard, Idaho where they make a final examination of some of the controlled plots.

L. N. Goodding left Corvallis on November 28 for Los Angeles, paying an official visit to Root in Sacramento, en route.

S. N. Wyckoff and C. C. Strong attended the annual meeting of the Trustees, Western White Pine Blister Rust Conference in Portland on December 7.

B. A. Ganoung recently spent two weeks at the Pacific Marine Supply Company shops in Seattle, to procure information on the operation, care and repair of motors used on chemical eradication.